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TEACHER RATING IN LARGE CITIES

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In a questionnaire investigation conducted by A. C. Boyce[1] in 1914, in connection with an attempt to devise a teacher-rating scale, certain points were brought out in regard to the method of rating teachers in the smaller cities. Mr. Boyce found that the almost universal practice in teacher rating, so far as the cities reporting were typical, was to depend upon the unanalyzed judgment of some school officer, usually the superintendent. In the smaller cities printed forms for rating teachers were almost unknown.

In order to ascertain exactly the method of rating teachers in use in the large cities, the writer directed the following letter to the superintendents in all of the 32 cities in the country which have a population of more than 150,000:[2]

> Will you please send me the forms that you use in rating elementary-school teachers. If you use no printed forms will you please indicate the general plan you use in estimating the teacher's efficiency.
>
> If you can give me any information as to when and where definite forms for rating teachers were first used I shall be very grateful. I am inclosing postage, and shall very much appreciate an early reply.

[1] *Fourteenth Yearbook of the National Society for the Study of Education*, pp. 14–15.

[2] On the basis of the 1910 census.

Twenty-seven superintendents responded to this request. The facts for two of the remaining five cities have been gathered from other sources.[1]

Eleven of these cities use no rating forms. These still depend upon the general estimate of the superintendent, the principal, the special supervisor, or all combined, supplemented by the teacher's record with regard to experience and professional preparation. In Chicago much stress is laid upon the teacher's successful experience, while in Cincinnati a great deal of stress is laid upon his preparation and continued professional growth.

TABLE I

Group I Cities Using No Rating-Form	Group II Cities Using Form Made Up of a Few Comprehensive Terms	Group III Cities Using Form Composed of a Long List of Unclassified Items	Group IV Cities Using Forms Consisting of Long Lists of Classified Items
Baltimore	Jersey City	.....	Boston
Chicago	Kansas City	Atlanta*	Cleveland
Columbus	New York	Milwaukee	Detroit†
Buffalo‡	Oakland	Toledo	Newark
Cincinnati	Philadelphia	(Minneapolis)§	New Orleans
	St. Louis	Denver	Providence
Indianapolis	.....	.....	Rochester
Los Angeles	.....	.....	Washington
Portland	.....	.....	.....
San Francisco	.....	.....	.....
Seattle	.....	.....	.....
St. Paul	.....	.....	.....

*Atlanta uses a form containing ten rather inclusive terms. She can be more justly classed with Group III, however, than with any other group.

† Elliott scale, slightly modified.

‡ No form for regular teachers. Form of sixteen items for substitute teachers.

§ Form received late, not included in the above discussion.

The rating-forms used in the seventeen remaining cities defy accurate classification. Among some of these there is a wide variation in the emphasis placed upon the various phases of teaching ability, and consequently in the items included in the rating-form. Even between those cities which agree as to the importance of the large bases of teaching ability there is little agreement in regard to the extent to which these larger factors shall be further analyzed. The four groups in Table I represent the classification

[1] See Elliott: *City School Supervision*, pp. 154–60, for forms in use in New Orleans and Philadelphia.

which the writer has made, in order to facilitate a further discussion of these forms.

Superintendents in some of the cities in Group I report certain inclusive qualities which they try to keep consistently in mind in forming judgments of teachers, but they do not attempt to formulate these in writing. One of these eleven superintendents expresses his regret that he has no rating-form. Another writes very emphatically that he wishes nothing so mechanical. The other nine are silent on this point.

Form I, used in St. Louis, is typical of the forms sent in from cities of Group II:

FORM I

Practical Efficiency			Professional Qualities		
Management of Children	Instruction	Attention to Details of School Business	Scholarship	Professional Interest and Growth	Personal Qualifications

Such a form suggests the large divisions of teaching ability. It leaves to the person rating, the task of analyzing these comprehensive terms, estimating in terms of the itemized elements of each and summing up the results in the form of ratings in the few inclusive terms. The alternative to this method for the person using a form of this sort is to depend upon a general impression based on a few conditions which, experience has taught him, stand out in recitations of a given grade, good or bad. In exceptional cases this may be a trustworthy method, but the writer believes that such a scheme is far less reliable in general use than a more detailed form.

Form II, used in Toledo, is an example of the forms used in the cities of Group III:

FORM II

1. Name of teacher.....
2. Scholarship.....
3. Success in teaching.....
4. Preparation of lessons.....
5. Ability to hold attention of class.....

6. Success in discipline and control of pupils.....
7. Spirit of school.....
8. Care of room .....
9. Health.....
10. Personal appearance.....
11. Professional industry and spirit.....
12. Self-control.....
13. Attitude toward children.....
14. Attitude toward parents.....
15. Attitude toward other teachers.....
16. Does the teacher co-operate heartily with the principal?.....
17. Is she faithful? Reliable? Progressive? Punctual?.....
18. Do outside duties or pleasures render this teacher relatively less efficient in her school work?.....
19. What is the most successful feature of this teacher's work?.....
20. The weakest feature?.....
21. How many times has this teacher been tardy this year? How many days absent?.....
22. Approximately how many times have you visited this teacher's room during the present year?.....
23. Do you recommend that this teacher be retained, basing your answer solely upon the question of efficiency?.....
24. Remarks.....

It is unwise to criticize a rating-form too harshly when the results obtained by its use are not known. However, the Toledo form, representing the type of form used in the cities of Group III, invites adverse criticism from several points of view.

This form shows no evidence of an attempt at a thoroughgoing analysis of teaching ability and no consistency in the arrangement of the items. It appears to be little more than an attempt to enumerate as many as possible of the items which are connected with the teacher's efficiency, with no indication of their relative importance or of their interrelationships. All of the items are apparently considered co-ordinate. There is also much duplication among the items. "Ability to hold attention of class" cannot be judged as distinct from "Success in discipline" and "Control of pupils"; neither can "Preparation of lessons" be separated from "Professional industry and spirit"; while "Success in teaching" must, at least partially, include many of the other items.

This form is fairly representative of early attempts at form-making. It represents a necessary stage in the development of rating-forms, but this stage is happily passing, if we may judge by the fact that very few of the important cities now use forms of this type.

Form III, used in Cleveland, represents well the forms used in the cities of Group IV:

FORM III

1. TEACHING POWER:
   - *a*) Does she apply thought and method to the preparation of her daily work?
   - *b*) Is she definite in her instruction? Thoughtful?.....
   - *c*) Does she develop power in her pupils?.....
   - *d*) What kind of results does she obtain?.....
2. EXECUTIVE POWER:
   - *a*) Is she successful in discipline?.....
   - *b*) Does she secure a responsive working spirit in the school?.....
   - *c*) Are her relations with the principal's office satisfactory in matters of reports, care of property, discipline of pupils, etc.?.....
   - *d*) What are her relations with the patrons of the school?.....
   - *e*) What are her strong points?.....
   - *f*) What are her weak points?.....
3. PERSONAL INFLUENCE:
   - *a*) Does she inspire her pupils and develop in them enthusiasm for work?
   - *b*) Does she inspire her pupils to independence in work?.....
   - *c*) Does she influence her pupils for good beyond the time they are in her presence?.....
   - *d*) Are her relations with other teachers in the building wholesome?.....
   - *e*) Is her work interfered with by outside pleasures or duties or the state of her health?.....
4. PROFESSIONAL SINCERITY:
   - *a*) Is she sincere and earnest in her work?.....
   - *b*) Does she measure thoughtfully the outcome of her practice?.....
   - *c*) What is her attitude toward the large interests of her profession?.....
   - *d*) Is she frank and candid in her dealings with pupils?.....
   - *e*) In what spirit does she receive the suggestions of the principal and supervisors?.....
   - *f*) Does she regard them as personal or professional?.....
5. GENERAL CULTURE:
   - *a*) Are her scholarship and general information accurate and adequate?..
   - *b*) Are her manner, control of voice, and use of English satisfactory?....
   - *c*) Is she alert, progressive, and open-minded to new ideas?.....

d) What are her special interests?.....
e) Has the teacher's personality been sufficiently faulty to require serious criticism?.....
(1) Have you made such criticism?.....
(2) How often?.....
(3) With what effect?.....

While the position of a number of the items might be seriously questioned, this form shows clearly an attempt to make a real analysis of the ability of the teacher. Some such detailed itemized form for rating is necessary for most principals and supervising officers, if not for all. The superintendent who has analyzed teaching ability and satisfied himself as to the elements constituting it may think it unnecessary to formulate his scheme in writing. This is probably the position which the advocates of the St. Louis type of form would take. Where the actual rating and supervision must be left to other persons, however, as it must be in the larger cities, a form containing a rather definite and detailed list of items is very necessary.

The new rating-forms just prepared for use in Boston almost deserve a separate classification. The Department of Educational Investigation and Measurement, under the direction of Frank W. Ballou, has worked out the most elaborate scheme of teacher rating yet devised in any school system. Three long forms of four pages each are used, and in these a complete analysis of the teacher's total efficiency is attempted. One form deals at length with the teacher's professional preparation; another with his continued professional growth, as evidenced by educational articles or books written, educational literature read, summer schools attended, etc. The third form is made up of two general topics: Personal Equipment and Ability as a Teacher. Personal equipment includes personal characteristics under nine sub-topics. Teaching ability includes management of the room, management of the class, and teaching the lesson. Eighteen items are subsumed under these last three sub-topics.

These forms are too bulky to be included in this study, but the foregoing description will give some idea of the elaborate forms which are being devised in the more progressive cities.

The earliest use of a printed form for rating teachers, which could be traced, was in Milwaukee in 1896. Other cities began the use of such forms as early as 1900.

The situation in regard to teacher rating in the large cities is encouraging, at least in so far as the scale for the total efficiency of the teacher is concerned. While nothing approaching a common agreement as to the elements which constitute efficiency in the teacher and far less agreement as to the comparative value of each has been reached, there is a great deal of experimentation in progress, which should lead in time to a solution of the problem.

COURSE OF STUDY IN SECONDARY MATHEMATICS IN THE UNIVERSITY HIGH SCHOOL, THE UNIVERSITY OF CHICAGO

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INTRODUCTION

In the following course of study it is aimed so to reorganize the body of secondary-school mathematics as to fit the subject effectively to the needs of the students and to make it more productive for mental life and growth. Since 1903 the departments of mathematics of the University High School and the School of Education have been developing a solution of the problem of mathematical reorganization along the lines of correlation. By the bringing together of subjects that are closely related, each is reinforced by the aid of the others, and the entire work in these subjects is unified and vitalized. For example, algebra and geometry supplement each other. Both are used to express facts about quantity. The formula and the graph are only different ways of expressing the law of a group of numerical facts. Each states the facts in generalized form and thus makes the deduction of any number of particular cases possible. Moreover, when the two forms of thought are correlated in a single course of instruction the student's comprehension of quantity is at the same time deepened and simplified—deepened because of the more enduring impression made upon the mind; simplified because the double method of attack makes it easier to overcome difficulties by supplying always a strategic alternative.

The student will see the advantages of having various modes of treating the facts of quantity. Thus, he is made to realize the value of algebra by seeing the superiority of algebraic methods in

important respects as compared with arithmetic and geometric methods.

When the various mathematical subjects are treated separately, each tends to take on the rigid form of the final science. This leads inevitably to a certain formalism in the mode of presentation. Such formalism is not the best method for the high-school pupil. Correlation helps to avoid excessive formalism. Rigor is not carried beyond the understanding of the pupil.

Leading mathematicians and professors of the teaching of mathematics have long recognized the relationship between the various subjects of secondary mathematics, especially algebra and geometry, and have advocated the desirability of teaching them together. The details of a plan for this correlation are being worked out in the University High School and the content of the first-year course is now well organized and is given in *First-Year Mathematics*, a textbook published by the University of Chicago Press. The second-year course is contained in *Second-Year Mathematics*, also published by the University of Chicago Press. Work on the third- and fourth-year courses is progressing and it is hoped to publish them in the near future.

AIMS AND VALUES

Among the purposes of secondary mathematics the following are emphasized:

1. A knowledge of the fundamental facts and principles of mathematics, needed by students because of the correlation of these facts and principles with other studies, such as science, drawing, geography, and arithmetic (verification of the familiar geometric formulas used in arithmetic), and because of their usefulness in science (astronomy, physics, chemistry, geology, economics, all use mathematics), engineering, designing, architecture, navigation, railroad building. The best interest in mathematics cannot be secured without a considerable number of practical problems that come within the comprehension and observation of the ordinary pupil.

2. Development of spatial and pictorial imagination; i.e., the ability to visualize objects, relations, and conditions. This train-

ing, which cannot be secured from other high-school subjects, is a real need in life, especially for those who cannot go beyond the high school.

3. Development of functional intuition; i.e., of the appreciation of the dependence of one magnitude upon another. The pupil learns to attack new problems with the fertile question: "What relations are here involved?" rather than the sterile: "What is the unknown here?" The existence of this dependence falls within the experience of every pupil.

4. The disciplinary value; e.g., training in accurate thought and power of concentration; the acquisition of orderly habits of precise oral and neatly written expression and, not at all the least, of honesty, i.e., of saying exactly what one means and meaning exactly what one says; training in setting out to do a specific thing and doing precisely that thing; i.e., training in the habit of "making good." The disciplinary value of mathematics always has been considered one of the principal values of mathematics.

5. Improving the study-habits of the student. Since supervised study is easily introduced in mathematics, this subject is especially valuable as a means of teaching students how to study.

FIRST-YEAR MATHEMATICS

GENERAL STATEMENT

In his elementary mathematics the student has learned to add, subtract, multiply, and divide numbers and to use his knowledge of these operations in the solution of problems. He has become acquainted with the common geometrical forms and many relations of geometrical magnitude. In many respects algebra is like arithmetic. It consists of the study of the operations and is an effective tool for solving problems. The study of algebra enables the student to get a better understanding of the principles underlying arithmetic, to express laws in brief form, and to abbreviate the language in the solution of problems. Hence, in a first course in secondary mathematics the student should continue the study of numbers and extend his knowledge of the fundamental notions of geometry.

In planning the work of the year, the following facts have been kept in mind:

Each of the various divisions of secondary mathematics—arithmetic, algebra, geometry, and trigonometry—includes simple principles relatively easy to master and also difficult complex principles. The simple principles are best suited to beginners, and may therefore be brought together in an introductory course which leads up to the more complex aspects of these various branches of mathematical science.

When they make the acquaintance of only one subject in mathematics during the first year, many students fail to get an insight into secondary mathematics. Discouraged by failure in one subject, these pupils do not continue the study, and thus they miss the opportunity to discover that they can be successful in another subject. However, in an introductory course in which algebra and geometry are taught together, success in one field will arouse an interest and enthusiasm which will encourage the student to attack the other with increased vigor. The result will be a gain in mathematical power and no less in general training. In the first-year course, geometry is used throughout to illustrate algebraic processes, while algebra carries on the reasoning in the compact and abstract symbols which generalize quantitative facts to an extent which is impossible in graphic expression.

The fundamental notions of trigonometry, which are commonly kept from the student until the third or fourth year of high school, appeal to him because of their usefulness as tools in problem-solving. Hence these notions are introduced at an early stage and they are so presented as to create no material difficulty for the beginner.

AIMS

Ability to solve simple equations in one or more unknowns, to solve quadratic equations in one unknown, to maintain algebraic expressions and formulas, and to represent given data in algebraic symbols.

To review, clarify, and develop informally the fundamental notions of geometry such as point, line, plane, surface, solid, angle, parallel lines, etc., and certain fundamental facts of geometry, as equality of angles, of line-segments, congruence, similarity, and symmetry of figures. Review of the formulas of geometry generally taught in arithmetic.

Ability to represent numerical facts graphically.

To acquire general familiarity with the instruments used in geometry.

To remove the great difficulties found by students when taking up logical geometry, by passing gradually and almost imperceptibly to the deductive method of demonstrative geometry.

METHODS

Algebra is introduced as a natural means of expressing facts about number, gradually becoming a symbolic language, especially adapted to stating conditions of a problem in a natural and helpful way. The growing difficulty and complexity of problems then lead to the necessity of learning how to manipulate algebraic symbols and expressions, and how to solve Algebraic equations. The symbolism of algebra thus becomes a highly clarifying instrument of problem-analysis and problem-solving.

Strong emphasis is placed upon intuition, observation, description, and motor control. At first students are taught to measure, to construct with rules and compass, to recognize the fundamental forms of geometry in the classroom and elsewhere. This suggests the geometric truths. Concepts and facts discussed are first expressed in terms already familiar to the student, then gradually translated into the precise language of geometry. The fact that measurements are at best only approximate, and are very tedious and difficult if carefully done, gradually leads to a desire for better methods and to a need for the logical method. In short, these experiences motivate the logical procedure. However, attempts at lengthy formal demonstration are not made. The method of proof is always informal, its aim being to establish geometric facts and to prepare for, not to develop skill in, logical demonstration.

The laws of algebra are carefully illustrated, and thus the student is enabled to avoid the danger of symbol-juggling without insight into the real meaning. Certain processes which belong together logically are separated in treatment because they present real difficulties for the beginner. Hence, wherever the processes are not needed as instruments of instruction they are taught separately; e.g., the meaning of positive and negative numbers, the

laws of signs, and the operations with positive and negative numbers are not studied until the pupil has become thoroughly familiar with unsigned literal numbers and with operations and laws of such literal numbers.

CONTENT

I. THE STRAIGHT LINE.
- Measurement of line-segments.
- Ways of expressing facts about quantity.

II. ADDITION AND SUBTRACTION.
- Graphical addition and subtraction.
- Perimeters.
- Algebraic addition and subtraction.

III. THE EQUATION.
- Use of axioms in solving equations.
- Problems to be solved by the aid of the equation.

IV. ANGLES.
- Classification of angles.
- The measurement of angles.
- The use of the protractor in measuring angles.
- The sum of the angles of a triangle.
- The sum of the exterior angles of a triangle.
- To draw an angle equal to a given angle.

V. AREAS AND VOLUMES. MULTIPLICATION.
- Area of a square.
- Area of a rectangle.
- Volume of cube and parallelopiped.
- Graphing equations.
- Multiplication of monomials.
- Addition of monomials.
- Multiplication of a polynomial by a monomial.
- Multiplying polynomials by polynomials.
- Area of parallelogram and triangle.

VI. ANGLE-PAIRS.
- Adjacent angles.
- The sum of the adjacent angles about a point on one side of a straight line.
- The sum of the angles at a point.
- Supplementary angles.
- Complementary angles.

Opposite angles.
The acute angles of a right triangle.
Angle-pairs formed by two lines intersected by a third.

VII. Parallel Lines. Lines and Planes in Space.

Parallel lines.
Angles of the parallelogram and trapezoid.
Models of geometrical solids.

VIII. Measurement of Lines in Space. Similar Figures.

Drawing to scale.
Ratio.
Similar figures.
Problems in similar figures.

IX. Ratio. Variation. Proportion.

Trigonometric rates.
Ratio.
Direct variation.
Inverse variation.
Proportion.
Proportionality of areas.

X. Congruence of Triangles.

Congruence.
The isosceles and the equilateral triangle.
The right triangle.

XI. Constructions. Symmetry. Circle.

The fundamental constructions summarized and proved.
Applications of the fundamental constructions.
Symmetry.
The circle.

XII. Positive and Negative Numbers. The Laws of Signs.

Uses of positive and negative numbers.
Graphing data.
Addition of positive and negative numbers.
Subtraction of positive and negative numbers.
Law of signs in multiplication.
Multiplication by zero.
Product of several factors.
Law of signs for division.

XIII. Addition and Subtraction.

Review of the laws of addition.
Addition of monomials.

Addition of polynomials.
Subtraction of monomials.
Subtraction of polynomials.
Removal of parenthesis.

XIV. MULTIPLICATION AND DIVISION.

Multiplication of monomials.
Multiplication of polynomials by monomials.
Multiplication of polynomials by polynomials.
Multiplication of arithmetical numbers.
Division of monomials.

XV. SPECIAL PRODUCTS. FACTORING. QUADRATIC EQUATIONS.

The square of a binomial.
Factoring trinomial squares.
Product of the sum of two numbers by their difference.
Factoring the difference of two squares.
The product of two binomials of the form $(ax+b)(cx+d)$.
Factoring trinomials of the form ax^2+bx+c.
The theorem of Pythagoras.
Square root of arithmetical numbers.
Quadratic equations.
Quadratic equations solved by factoring.
Quadratic equations solved by completing the square.

XVI. PROBLEMS LEADING TO EQUATIONS OF THE FIRST DEGREE IN ONE UNKNOWN.

Solution of problems and equations.
Geometric problems.
Problems involving number relations.
Motion problems.
Clock problems.
Problems on percentage and interest.
Mixture problems.
Lever problems.

XVII. LINEAR EQUATIONS CONTAINING TWO OR MORE UNKNOWN NUMBERS.

A system of two linear equations.
Graphical method of solving a system of equations.
Algebraic solution of equations in two unknowns.
Geometric problems.
Motion problems.
Miscellaneous problems.
Fractional equations.
Systems of three or more linear equations.

XVIII. THE FORMULA.

The formula as a general rule.
Evaluation of formulas.
Expressing one of the letters of a formula in terms of the others.

XIX. REVIEW AND SUPPLEMENTARY QUESTIONS AND PROBLEMS.

TEXTBOOK

Breslich's *First-Year Mathematics*, published by the University of Chicago Press, is used in the first-year course.

TIME REQUIRED OF STUDENTS

Five one-hour class periods a week throughout the school year are given to mathematics. Probably an average of fifteen minutes of the period is used for supervised study where special attention is given to the individual differences existing among students. An average of about fifteen minutes a day is expected for home work. This work is generally of the same type as the work done in the classroom.

STANDARDS OF ATTAINMENT

The student who expects to take only one year of mathematics in the high school has acquired a knowledge of such geometric facts as he is most likely to make use of in later life; he knows enough algebra to prefer the algebraic method of solving problems to the less effective arithmetic method; and he has had a good review of the fundamental processes with arithmetic numbers.

The student who expects to go on with the study of mathematics has laid a good foundation upon which to build the future work.

TYPE LESSONS

I. *A lesson illustrating how to take up the study of the addition axioms.*—Line-segments are used to establish a concrete basis for this study.

The teacher draws on the blackboard two pairs of equal line-segments as AB and CD, and EF and GH, Fig. 1 (see p. 657). A student is then asked to draw on the board the sums of $AB+EF$ and $CD+GH$. Another student measures these sums and compares them. He finds that they are equal.

The problem is then repeated in a somewhat different form: Letting a, b, c, and d be the lengths of four segments such that $a=b$, and $c=d$, show by measuring that $a+c=b+d$. By means of these problems the student is led to state the addition axiom in his own

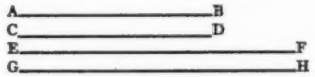

FIG. 1

words. He finds in the textbook, on the other hand, a statement of the axiom with which to compare his own: Equals added to equals give equals.[1] The second problem makes him familiar, while he is learning the statement, with the form in which this axiom is usually applied. At the same time he is acquiring valuable training in the ability to measure—so important for all graphical work.

II. *A lesson illustrating how abstract discussions are introduced with concrete illustrations.*—The use of axioms in solving equations is preceded by the solving of equations by the aid of the balance.

In making a study of the equation we must begin with some very simple problems in order that we may clearly understand the new laws to be developed. If these laws are mastered in connection with simple cases, it will be easy to apply them later to more complicated and difficult cases. Let us solve the following problem: A bag of grain of unknown weight, w ounces, together with an 8-oz. weight, just balances an 18-oz. weight. How much does the bag of grain weigh?

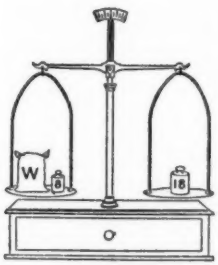

FIG. 2

The problem may be stated in an equation, thus:

$$w+8=18. \quad \text{Find } w.$$

Suppose 8 oz. to be taken from each pan, Fig. 2, giving

$$w=10$$

The bag of grain weighs 10 oz. Showing $w+8=18$.

At this point it is necessary to define two mathematical terms: An equation, as $w+8=18$, may be regarded as an expression of

[1] *First-Year Mathematics*, p. 17.

balance between the numbers on the two sides of the equality sign. The number to the left of the equality sign is the left side, or *left member* of the equation, the number to the right is the right side, or *right member*.

Thus, in the equation $a+5=7$, $a+5$ is the left member and 7 is the right member.

Several equations are now written on the blackboard, and pupils state in words problems expressed by these equations.

These equations are then solved by the aid of the balance.

We shall now learn how to solve an equation without the use of the balance. An equation, as $w+8=18$, may be regarded as stating the question: What number added to 8 gives 18? It has been shown that the answer may be found by interpreting the equation as a problem in weighing and then taking 8 oz. from both pans of the balance. Just as the scales will balance if the same number of weights are taken from each pan, we may subtract the same number from both sides of an equation and get another equation. The work of finding the unknown number this way may be arranged in written form thus:

$$\begin{aligned} \text{Let } & w+8=18 \\ & 8=\ 8 \\ \hline \text{Then } & w\ \ =10 \end{aligned}$$

For, if the same number be subtracted from equal numbers, the remainders are equal (subtraction axiom).

To test the correctness of the result, replace the unknown number in the original equation by 10, obtaining $10+8=18$. Since both members of the equation reduce to the same number, the result $w=10$ is correct.

This is followed by solving a number of equations of the same type as above using the subtraction axiom.

III. *This lesson illustrates the "experimental method" in geometry.*—We are to show that the sum of the angles of a triangle is 180°. At first the truth of the theorem is shown by intuition as follows:

Draw a triangle. Cut the triangle from the paper. Tear off the corners and place the angles adjacent to each other, Fig. 3.

What seems to be the sum of the angles of the triangle? The student states that the sum is a straight angle or 180°.

The same fact is now shown in a different way. That the sum of the angles of a triangle is 180° can be shown by rotating a stick

FIG. 3

or a pencil successively through the angles, as follows: Draw a triangle. Place a pencil or stick in position 1, Fig. 4, and note the direction in which it is pointing. Rotate the pencil through angle x. Then move it along AB to position 2. Turn the pencil through angle y and move it along BC to position 3. Turn it through angle z to position 4. The pencil has now rotated through an amount equal to $x+y+z$. Note the direction in which the pencil is pointing in the last position. Through what part of a complete turn has it rotated? Through how many right angles? Through how many degrees?

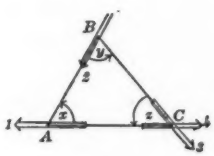

FIG. 4

The student is now asked to express the new fact in algebraic symbols: State by an equation the number of degrees in the sum of the angles x, y, and z of a triangle.

By means of this equation it is possible to find an angle of a triangle when the other two are known. This is of great importance, e.g., it enables surveyors to find all angles of a triangle although they may be able to measure directly only two angles.

The new principle is now used in the solution of a number of problems. In solving the next problems observe the following steps: Make a sketch of the triangle, denoting the angles as given in the problem. To obtain the equation use the theorem that the sum of the angles of a triangle is 180°. Solve the equation and find the values of the angles.

Illustrative problem: The difference between two angles of a triangle is 20°, and the third angle is 36°. Find the unknown angles.

Let x be one of the angles, Fig. 5.

Then $x+20$ is the second angle.

The third angle is given equal to 36.

Therefore $x+x+20+36=180$, since the sum of the angles of any triangle is 180°.

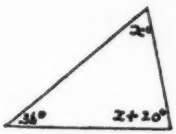

FIG. 5

Solving for x, we have

$$\begin{aligned} x &= 62 \\ x+20 &= 82 \\ 36 &= 36 \end{aligned}$$

Check: $x+x+20+36=180$

IV. *The following lesson illustrates the "informal method of proof," used in the later part of the course, when a change is made from the experimental to the logical procedure.*—It is proposed to prove the following theorem: The shortest distance from a point to a line is the perpendicular from the point to the line.

No attempt is made to observe the form used in demonstrative geometry, i.e., to state first the hypothesis, then the conclusion, and finally the proof. Instead, the student begins at once to reason as follows: Let AB be perpendicular to DE, Fig. 6, and let AC be any other line from A to DE.

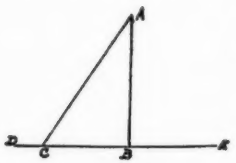

FIG. 6

Angle C in triangle ABC is acute, for if one angle of a triangle is 90° the other angles are less than 90°.

Therefore angle C must be less than B, which is a right angle.

It follows that AB is less than AC, for if two angles of a triangle are unequal, the sides opposite are unequal, the greater side being opposite the greater angle.

V. *The following lesson shows how geometry is used to establish a concrete basis for abstract discussions.*—The law of signs in multiplication is taken up after the student has had a half-year's work in high-school mathematics. It is approached by means of four problems, as follows:

1. Find the product of $(+4)$ by $(+3)$.

Solution: Since $(+3)(+4)$ is the same as $(3)(+4)$, it follows that $(+3)(+4)$ equals $(+4)+(+4)+(+4)=(+12)$. Geometrically this means that to multiply $(+4)$ by $(+3)$ is to lay off $(+4)$ three times in its own direction, Fig. 7.

Thus $(+3)(+4)=(+12)$.

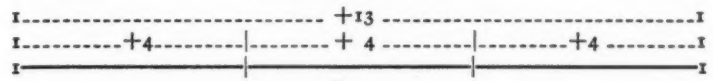

FIG. 7

2. Find the product of (-4) by $(+3)$.

Solution: Since $(+3)(-4)$ is the same as $(3)(-4)$, $(+3)(-4)=(-4)+(-4)+(-4)=(-12)$.

Make a drawing for $(+3)(-4)$, i.e., lay off (-4) three times in its own direction.

Thus, $(+3)(-4)=(-12)$

3. Find the product of $(+4)$ by (-3).

Solution: Assuming that the commutative law holds for positive and negative numbers (the student is familiar with this law) then it follows that

$$(-3)(+4)=(+4)(-3)=(-12)$$

Notice that the same result is obtained by laying off $(+4)$ three times in the direction opposite to its own direction. Make a drawing for this product.

4. Find the product of (-4) by (-3).

According to problem 3, this means that (-4) is to be laid off three times in the direction opposite to that of (-4).

Thus, $(-3)(-4)=(+12)$

Then, from a study of the results of problems 1–4, the law of signs is deduced.

SECOND-YEAR MATHEMATICS

ORGANIZING PRINCIPLES

The combined type of material of the mathematics of the first year is to be carried forward through the second year, the emphasis being on geometry.

The operations and laws of arithmetic should be reviewed wherever opportunity is offered and occasion warrants, as in the evolution

of formulas, in the introduction of new algebraic topics, and in problems of computation.

The algebraic ground gained in the first year should be held and extended at least as far as is customary with the algebra before the third year.

The geometry should be largely of the demonstrative type.

The student should receive training in both plane and solid geometry. Many theorems of solid geometry closely related to corresponding theorems in plane geometry should be proved in the second year, thus training the student in both two- and three-dimensional thinking.

The study of trigonometry begun in the first year is to be continued. Trigonometric methods should often replace algebraic and geometric methods, giving the student the opportunity to see some of the advantages of trigonometry over algebra and geometry.

AIMS AND VALUES

To complete the study of plane geometry and algebra begun in the first year. By this is meant to cover the essentials of what is commonly required of students in the first two years of secondary schools in this country.

To include in addition the elementary notions of trigonometry; the application of three trigonometric functions (sine, cosine, and tangent) to the solution of the right triangle, and to a number of practical problems; the development of some of the fundamental relations between these functions, the use of these functions in proving geometric theorems.

To begin and to make a real advance in the study of solid geometry before completing plane geometry. This includes the theorems on lines and planes in space, diedral angles, areas of surfaces, and volumes of solids, omitting the discussions of polyedral angles and spherical polygons.

No topical treatment of the theory of limits is intended. Such a treatment is not believed to belong to the early years of the high-school course. However, the question of the existence of incommensurable lines and numbers is raised, examples of these are given, and the notion of the limit of a sequence is developed.

The material as arranged in this course opens to the student a broader, richer, a more useful and therefore more alluring, field of ideas and lays a more stable foundation for future work than does any separate treatment. A great saving of the student's time is effected, by developing arithmetic, algebra, geometry, and trigonometry side by side. This also makes unnecessary the long and tiresome reviews usually given at the beginning of each subject, replacing them by frequent incidental reviews leading immediately to an extension of the subject.

Often a high-school pupil fails rightly to esteem a high-school subject because he cannot discern its bearing on what has preceded and on what is to follow. But having seen the closeness of the relation between the subjects, he does not lose view of the familiar fields while at the same time he obtains an outlook into neighboring and more remote fields. There is, thus, the economy resulting from accomplishing more work in less time and from the performance of tasks that are intelligently motivated.

METHODS

In the first-year course the student has gained a thorough understanding of the fundamental notions of geometry. Hence in the second year somewhat formal methods are introduced from the start. Even before this, the advantage of the reasoning process over the process of measuring has been recognized. Mathematical fallacies and optical deceptions are now used to make the need of a logical proof still more apparent.

To develop in the pupil a sort of geometrical strategy, i.e., to attack, to take possession, and to exploit a geometrical problem, methods of proof are discussed and emphasized, not once for all, but throughout the course. To cultivate versatility and system, students are taught to choose between various methods of proof and to follow some definite plan rather than to trust the chance of stumbling upon a proof. Many model proofs are therefore given, while in other proofs statements or reasons that should be apparent to the student are omitted with the purpose of making him independent and of developing his powers of argumentation.

The old method of dividing the subject of geometry into a few books has been abandoned as being of only traditional value. The

course is divided into a number of short chapters, each dealing with one or a few central topics. This arrangement is far better adapted to study by high-school students, since the aims and purposes of the several chapters are easily seen. It is more economical of the student's time and energy than the old method.

Since the usefulness of a study is what always appeals most strongly to a beginner, this phase is emphasized throughout the course. The importance and the significance of geometrical facts in the affairs of everyday life are impressed upon the pupil.

The plan of introducing definitions whenever needed and not before, which is used in the first-year course, has been followed also in the second year.

By the employment of algebraic notation and by the continued application of the equation to geometrical matters, a firm hold is kept on algebra. New algebraic topics are developed when opportunity and need arise. Thus, elimination by comparison and by substitution, so frequently needed in proofs and in the solution of exercises, is taught very early. The solution of the quadratic equation by means of the formula, the operations with fractions, and factoring are all reviews or further extensions of topics whose study was begun in the first year.

A number of geometric proofs have been simplified by the use of trigonometry.

CONTENT

I. METHODS OF PROOF.
Logic, Geometrical fallacies.
Methods of proofs.

II. METHODS OF ELIMINATION.
Problems leading to equations in two unknowns. Elimination by addition, subtraction, substitution, comparison.

III. QUADRILATERALS.
Parallelogram.
Trapezoid.
Kite. Symmetry. Loci.
Primatic surfaces.
Lines and planes in space. Diedral angles.

IV. PROPORTIONAL LINE-SEGMENTS.
Uses of proportional line-segments. Proportional segments. Constructions.
Lines and planes in space.

V. PROPORTION. FACTORING. VARIATION.

Fundamental theorems.
Factoring.
Processes of obtaining proportions from given proportions.
Relation between proportion and variation.

VI. SIMILAR POLYGONS.

Uses of similar triangles.
Theorems on similar figures.

VII. RELATIONS BETWEEN THE SIDES OF TRIANGLES. THEOREM OF PYTHAGORAS AND ITS GENERALIZATIONS. QUADRATIC EQUATIONS.

Similarity of the right triangle.
Relations of the sides of a right triangle.
Quadratic equations.
Generalizations of the theorem of Pythagoras.

VIII. TRIGONOMETRIC RATIOS. QUADRATIC EQUATIONS IN TWO UNKNOWNS.

Determination of the values of trigonometric ratios of a given angle.
Determination of the values of the functions when the value of one function is given.
Exact values of the functions of 30°, 45°, and 60°.
Applications of the trigonometric functions.
Relations of trigonometric functions.

IX. THE OPERATIONS WITH FRACTIONS. FRACTIONAL EQUATIONS.

Addition and subtraction of fractions.
Multiplication of fractions.
Division of fractions.
Complex fractions. Fractional equations.
Trigonometric relations.

X. THE CIRCLE. THE SPHERE.

Review and extension of the properties of circles.
Diameters, chords, and arcs.
Tangent circles.

XI. MEASUREMENT OF ANGLES BY ARCS OF THE CIRCLES.

Measurement of angles.
Problems of construction.
Miscellaneous exercises.

XII. PROPORTIONAL LINE-SEGMENTS IN CIRCLES.

XIII. INEQUALITIES.

Review and extension.
Lines and planes in space.

XIV. Lines and Planes in Space.

XV. Loci. Concurrent Lines.

XVI. Regular Polygons and Circles.
Length of the circle.

XVII. Areas.
Comparison of areas.
Literal equations.
Area of the triangle.
Factoring.

XVIII. Areas. Areas of Polygons. Area of the Circle.
Proportionality of areas.
Problem of construction.

TIME REQUIRED OF STUDENTS

Five one-hour class periods a week throughout the school year are given to second-year mathematics. An average of about fifteen minutes of the period is used for supervised study. An average of about thirty minutes a day is expected for home work.

TEXTBOOK

Breslich's *Second-Year Mathematics*, published by the University of Chicago Press, is used in the second-year course.

STANDARDS OF ATTAINMENT

While in the preceding course geometric facts were established mainly by the inductive and the experimental methods, the student now has learned to demonstrate the proofs of geometric facts and to attack the solution of problems and exercises by various methods. He has completed the work that is usually given in a course in plane geometry.

In algebra he has had a review and extension of his knowledge of the solution of equations by various methods, of factoring, of fractions, and of quadratic equations. He has covered what is ordinarily given in a one-year course of algebra and some of the work is given in "intermediate algebra."

He has made a beginning of the study of trigonometry. A large part of the solid geometry has been completed.

TYPE LESSON

The following lesson illustrates the method of presenting a theorem in geometry in the second-year course.—It is required to prove that if the alternate interior angles, formed by two parallel lines and a transversal, are equal, the lines are parallel.

Several students are asked to state the theorem. This is kept up until it becomes apparent that every member of the class has memorized the statement.

The class is then asked to think about the figure. A few moments later a student is called upon to draw the figure on the blackboard.

Then the hypothesis is stated definitely with reference to the figure, using the best symbolic notation.

Similarly the conclusion is obtained.

Even the poorest student in the class must be able to do the work up to this point.

Then follows the preliminary discussion (analysis).

Q. What are we to prove? A. $AB \parallel CD$.

Q. When are two lines parallel? A number of theorems are suggested by the class and the following is selected as the most promising for our purpose: Two lines are parallel, if they are perpendicular to the same line. This suggests drawing a helping line perpendicular to AB to prove that it is perpendicular to CD, as HG.

Q. When are two lines perpendicular? A. If they are at right angles.

Q. How may we prove angle G equal to a right angle? A. By proving $\angle G = \angle H$.

Q. How may we prove two angles equal? From a number of answers the congruent triangle method is selected.

Q. Who can prove triangles HEM and FGM congruent? The proof is given by a student.

We now retrace the order of the steps in this analysis and obtain the proof. After the proof is given, the essential steps are emphasized and the theorem is assigned for review as home work.

THIRD-YEAR MATHEMATICS

GENERAL STATEMENT

The work of the third year is a continuation of the study of the topics given in the preceding years, the emphasis being mainly on algebra and trigonometry.

AIMS

During the second year the study of plane geometry has been completed.

During the third year the study of algebra and trigonometry is to be continued. The work in solid geometry, begun in the first year and continued in the second, is to be completed in the third.

CONTENT AND METHODS

A. Equations

I. Linear Equations in One Unknown.

This work begins with verbal problems of a type more difficult than those of the first and second years. As need arises, the processes of addition and subtraction, multiplication and division of polynomials are reviewed. This is done by solving equations which are of the first degree when put in the simplest form.

II. Linear Equations in Two or More Unknowns.

Methods of solution studied in the preceding courses are reviewed and summarized. The solution by determinants is added. At the end of this work the student must be able to solve systems containing very complicated literal and fractional equations. Equivalent and inconsistent equations are studied.

III. Quadratic Equations in One Unknown.

Review of methods of solution: Graphical method, factoring method, methods of elimination, and the formula. At the end of this work the student must be able to solve very complicated quadratic equations. Many verbal problems are solved.

Incidentally there are reviews and extensions of the processes of factoring, extracting roots of polynomials, and of simplifying monomials containing radicals.

Discussion of the nature of the roots of a quadratic equation.

IV. Quadratic Equations in Two Unknowns.

Graphing of quadratic equations makes the student familiar with the following lines: parabola, ellipse, hyperbola, circle, and a pair of

intersecting straight lines. The graphs illustrate the meaning of a solution, the number of solutions to be expected, and the process of the algebraic solution.

As in factoring, the student learns that he cannot solve *every* system of the second degree in two unknowns and proceeds to study *only certain* type forms. These forms suggest the method of solution. Some of these methods are applied even to systems of higher degree than the second.

In connection with the computations arising in problems the use of tables, slide rule, and graphs is taught.

V. EQUATIONS OF HIGHER DEGREE THAN THE SECOND.

The factoring method and the method of changing the equation into the form of a quadratic are used to solve the equations in this chapter. The student learns to form equations whose roots are given. Many verbal problems are solved.

VI. IRRATIONAL EQUATIONS.

The equations are solved either by squaring both sides, or by throwing them into the form of quadratic equations. Applications to solid geometry.

B. Functions

I. SERIES.

The binomial theorem and the formula for the nth term are developed and applied. Arithmetic and geometric progressions are studied.

II. FRACTIONS. The following topics are included:

The operations with fractions; complex fractions; fractional equations; problems leading to fractional equations.

III. VARIATION.

IV. EXPONENTS AND RADICALS.

C. Trigonometry

I. REVIEW AND EXTENSION: TRIGONOMETRIC RATIOS OF ACUTE ANGLES.

1. Definitions of six trigonometric ratios.
2. Constant value of any ratio for the same angle.
3. Equality of angles having equal trigonometric ratios.
4. Given the value of trigonometric ratio of an acute angle, to construct the angle and to obtain the values of the other trigonometric ratios.
5. Approximating by measurement the values of the trigonometric ratios of a given angle.
6. Changes of the trigonometric ratios of the angle A, as A increases from 0 to 90.

7. Trigonometric ratios of complementary angles.
8. Simple trigonometric equations.
9. Exact values of the trigonometric ratios of 30°, 45°, and 60°.
10. Solution of right triangles by means of natural functions.
11. Verbal problems.

II. Trigonometric Ratios of Positive and Negative Angles of Any Size.

1. Necessary definitions.
2. Laws of the quality of the trigonometric ratios for the various quadrants.
3. Six fundamental relations between the trigonometric ratios of an angle.
4. Problems including all of the above.
5. Proofs of identities.
6. Changes of the trigonometric ratios of an angle A, as A increases from 0° to 360°.
7. The trigonometric ratios of $(-A)$ in terms of the ratios of A.
8. The quadrantal formulas.
9. Applications.

III. Trigonometric Ratios of Two Angles.

1. Addition and subtraction formulas.

   (*a*) $\sin(A+B)$; $\cos(A+B)$; $\tan(A+B)$; $\cot(A+B)$.
   (*b*) $\sin(A-B)$; $\cos(A-B)$; $\tan(A-B)$; $\cot(A-B)$.

2. Trigonometric ratios of twice an angle in terms of the ratios of the angle.

   $\sin 2A$; $\cos 2A$; $\tan 2A$; $\cot 2A$.

3. Trigonometric ratios of half an angle in terms of the cosine of the angle:

   $$\sin\frac{A}{2};\ \cos\frac{A}{2};\ \tan\frac{A}{2};\ \cot\frac{A}{2}.$$

4. Sum and difference of sines and cosines expressed as products.

IV. Solution of Right Triangles with Logarithms.

1. Formal problems.
2. Verbal problems.
3. Isosceles triangles.
4. Regular polygons.

V. Solution of Triangles in General.

1. Law of sines.
2. Law of cosines.
3. Law of tangents.

4. Formulas for the case when three sides are given.
5. Discussion of the different cases and of the laws that apply.
6. Formal and verbal applications.
7. Area of triangle.
8. Circumscribed and inscribed circle.

VI. RADIAN MEASURE, GENERAL VALUES OF AN ANGLE, TRIGONOMETRIC EQUATIONS, INVERSE FUNCTIONS.

1. Definition of radian.
2. Radian measure of angles. Problems involving radian measure.
3. Principal value of an angle, ratifying an equation.
4. General value of angles.
5. Solution of trigonometric equations.
6. Inverse functions.

VII. PERIODS, GRAPHS, IMPORTANT LIMITS.

1. Periods of the trigonometric functions.
2. Curves:
   a) sine.
   b) cosine.
   c) tangent.
   d) cotangent.
   e) secant.
   f) cosecant.

D. Solid Geometry

I. AREAS OF SURFACES.
II. VOLUMES OF SOLIDS.
III. POLYEDRAL ANGLES.
IV. SPHERICAL TRIANGLES.

E. Surveying

A considerable amount of field work is done with the transit and measuring tape to awaken active interest and to make real the problems of the text.

TIME REQUIRED OF STUDENTS

Five one-hour periods a week throughout the school year are given to the mathematics of the third year. An average of about thirty-five minutes of home work is required. About one-third of the class period is used for study under supervision.

TEXTBOOKS

The best available textbooks are secured for the work of the third year. Slaught and Lennes, *Advanced Course in Algebra*, and Wilczynski, *Plane Trigonometry*, have been used during the last years.

STANDARDS OF ATTAINMENT

In three years the student has accomplished the work usually given in three and one-half years. This is due mainly to the correlation of the various subjects of mathematics, to the reorganization of the material usually taught during the first three years, and to the training obtained through supervised study.

FOURTH-YEAR MATHEMATICS

GENERAL STATEMENT

The course centers around the notion of functionality. It puts the emphasis upon the simple class of cases in which the functional dependence between the quantities involved may be expressed, directly or indirectly, by means of the fundamental operations. The course parallels a similar course in college algebra given in the Junior College of the University.

AIMS AND METHODS

The course is conducted informally with the aim of meeting the needs of a special group of students who intend to continue the study of mathematics or to prepare for the study of the sciences in the college. With their future needs in mind, emphasis is placed upon the fundamental functional relations, the manipulation of formulas, and the graphical interpretation of the functional relations. This graphical treatment forms the introduction to the major topic, namely the elementary discussion of the theory of equations. The minor topics of the course, such as series and determinants, are treated to the extent justified by the ability and the interest of the particular class. The emphasis is less upon formal requirements than upon voluntary contribution. Frequently this takes the form of brief reports by the students to supplement topics previously treated in class. Thus, reports of Forsyth's discussion of the solution of the general equation of the *n*th degree (*School Science and Mathematics*, December, 1915) supplements the last presentation of Horner's method of finding irrational roots of an equation.

In contrast to the earlier courses a maturer type of scholarship is demanded. Many problems related to the topics treated are

selected from other textbooks. Supervised study is used extensively. Since the student has been trained in habits of study through the supervised study of the preceding courses, he is able to work independently as soon as the theory of the particular lesson has been presented.

CONTENT

I. Review and Further Extension of the Topics of Previous Courses in Algebra.
   1. The laws of algebra: commutative, associative, of exponents.
   2. The operations in complex problems.
   3. Functions.
   4. Equations of first, second, and higher degrees in one or more unknowns. Difficult types of simultaneous quadratics. Determinants. Relations between roots and coefficients. Theory of quadratic equations.

II. Theory of Equations.
   1. All theorems leading up to, and used in, Horner's method.
   2. Logical proofs of these theorems.

III. Series.
   1. Binomial theorem for fractional negative exponents.
   2. Progressions.
   3. Convergent and divergent series.
   4. Undetermined coefficients.
   5. Permutations and combinations.

TIME REQUIRED OF STUDENTS

Five one-hour class periods a week during one-half of the school year are given to this course. The actual teaching time is approximately one-half of the hour and seldom exceeds that time. The required outside work is limited to thirty-five minutes a day.

TEXTBOOKS AND REFERENCES

The best textbook in college algebra available is used in this course. During the last years Rietz and Crathorne's *College Algebra* was used, but the development paralleled that of Wilczynski's *College Algebra*. The work is supplemented by reports on the elementary discussion of topics found in the journals of secondary-school mathematics.

STANDARDS OF ATTAINMENT

During this course the method of instruction has aimed to develop mathematical power and a mathematical maturity necessary for a successful pursuit of college mathematics. The gap between secondary and college mathematics is thus minimized, the student having learned to appreciate theory of a more difficult type than is ordinarily attempted in the high school.

PREPARATION FOR COLLEGE-ENTRANCE EXAMINATIONS

A course of two periods a week for the first semester and three periods a week for the second semester is required of all. Seniors during certification for admission to colleges which require mathematics in the first year, and of all candidates for recommendation for college-entrance examinations. One-half unit credit is given for this course. Class periods are conducted entirely as supervised study periods, no home work being required. The work of the first two and one-half years is summarized, reviewed, and extended.

FRENCH PHONETIC TRAINING IN THE UNIVERSITY HIGH SCHOOL

A. G. BOVÉE
University of Chicago High School

The object of the phonetic training which the student receives is twofold: first, the acquisition of a good pronunciation; secondly, and by no means the least important, the learning of the written values of the various sounds with a view to establishing finally such an exact relation between the spoken and the written word that the sound will very nearly indicate the correct spelling. This second result of the phonetic training has been found to be a very definite aid in vocabulary building. For, by constantly developing the memory of the ear through continual oral drill, a degree of efficiency is attained whereby not only words but whole sentences are very easily retained. The result is a combination which produces great speed in the acquisition of vocabulary coupled with unusual accuracy in spelling.

We begin by a careful consideration of the general characteristics of French pronunciation, namely, the lack of accent or stress in the pronunciation of the words, the purity of the vowel tones as contrasted with the diphthongized or rolled English vowels, the explosion of the consonants, the fact that the syllable always begins with a consonant, and the generally more energetic production of the sound. This is followed by an explanation of the vowel triangle, accompanied by a description of the mouth position for each vowel. As each sound is described, the phonetic sign of the Association Phonétique Internationale is given, so that a definite symbol is learned for each separate sound. It has been found very helpful as an aid to precision and speed in pronunciation work to have a sign for each sound. In this connection twelve oral and four nasal vowels are explained.

After thus establishing in the pupil's mind a definite idea of each separate and distinct sound, and carefully drilling the pupils

in their production, it is possible to attack the problem of the written values of the sounds. The accompanying chart (I and II) is put into the hands of the students. As can be observed, there have been arranged in columns under each sound sign the various combinations of letters which produce this sound. Here is the method of handling the chart. It is stated as an invariable fact that *ou* gives the sound **u**. Words like *fou, bout, boue, sous, jour* are given with explanation of the consonantal rules. Next *eau* is given as producing *o*. *Beau, peau, l'eau,* are given and then the two vowels presented are combined in words like *beaucoup, nouveau, couteau, rouleau. Au* is next explained and examples given like *haut, saut, saute,* then *faubourg, autour, vautour. On* is now explained as the nasal of *o*.

It is not customary in America to explain *on* as derived from *o*, but rather from ɔ. M. Camerlyneth, however, teaches it at the Sorbonne, and Abbé Rousselot of the Institute Catholique says that the sound for *õ* is midway in position between *õ* and ɔ̃. The *o* has a decided pedagogic advantage over ɔ̃ by enhancing the differentiation between *on* and *an*, two sounds that are very hard for the American ear to distinguish. If the student is taught *õ*, the natural aversion of the American to rounding his lips will relax the position sufficiently to be in accord with the views of Abbé Rousselot.

The explanation of *on* and *om* as producing *o* is followed by examples such as *bouton, mouton, nous sautons, contour, saumon, bourgeon, tombeau, monceau.* We continue this process of explaining the value in sound of a letter or combination of letters and of then giving words containing it and the combinations previously explained. When **e** is reached, a practical review is given of all the letters studied by presenting the series *goûté, beauté, sauté, bonté, ôté, porté, pâté, marché, parlé, rêvé, neigé, laissé, échappé, répété,* etc.

This, then, is the method of handling the chart. Each word is carefully selected with a view to building continually new words out of the vowel combinations already studied. About ten days are devoted to this work, with the result that the student can derive the pronunciation of a word from the spelling. This is the first stage in his phonetic training.

I. THE FRENCH VOWEL-SOUNDS

Alphabet of the Association Phonétique Internationale

1
u = *ooze*
ou (rouge)
oû, ou (goût)

2
o = *ode*
ô (côte)
au (pauvre)
eau (beau)
os (gros) (rose)
otion (notion)
-os, -ot, -o (gros, flot, Congo) } Final

5
a = *ah!*
â (âme)
as (pas)
ation (nation)
gazon
blason
a+ille (in nouns) (paille)
roi = wa (roi)

7
a = *arrow*
a+r (partir)
any *a* not in 5
as { ami / banane
e+mm (femme)
oi = wa (voir)

8
ɛ = *bed*
è (père)
ê (rêve)
ei (neige)
e (cher, fer)
ai (not final in verbs)
ay (crayon)
-aie (craie)
-ais (palais)
-ait (il parlait)
-et final (objet)
est (verb)
e+2 cons. (belle)
exceptions: see 6 and 7

4
ɔ = *taught*
o+r (encore)
au+r (saurai)
any *o* not in 2 or 3
as { poli / pomme / sonner

3
õ
on (bon), om (nom) } Final or followed by cons.

6
ã
an (tant), am (lampe), en (dent), em (temps) } Final or followed by cons.

9
ɛ̃
in (vin), im (grimper), ain (pain), aim (faim), ien (bien), ein (plein), eim (Reims), yn (syntaxe), ym (nymphe) } Final or followed by cons.

10
e = *mate*
é (été)
-ez (vous avez)
-er (aimer)
-ai (final in verbs)
ier (papier)
et (conj.)
ed (pied)
des amis
les amis
mes amis

11
i = *meet*
i (lire)
-ie (folie)
î (qu'il punît)
y (tyran)

12
y = { i as to tongue / u as to lips
u (dur)
û (sûr)
eu in *j'ai eu, j'eus, il eut, ils eurent*
eû in *nous eûmes, vous eûtes*

13
ø { e as to tongue / o as to lips
-eu (feu), eut (peut), -eux (vieux), eus (meus), -euse (meuse) } Final in syllable

14
œ { ɛ as to tongue / ɔ as to lips
eur (heure)
oeur (coeur)
eu+il, ill: (feuille)
ue+il, ill: (cueillir) (oeil)

15
œ̃
un (brun), um (parfum) } Final or followed by cons.

16
ə = oe, relaxed (see 14)
e, unaccented (venir, de lui, le)
e, not followed by 2 consonants (see 8)
ai in *faisant, je faisais*

For a period of four weeks six minutes of each recitation are devoted to a review of this work and drill in the phonetic signs, together with pronunciation practice, through reading. First the phonetic signs must be placed under the vowels in the dictations studied. Then gradually the consonant mouth positions are explained, and the same process is employed as with the vowel

II. THE FRENCH CONSONANT-SOUNDS

ALPHABET OF THE ASSOCIATION PHONÉTIQUE INTERNATIONALE

s=hiss

s initial (soeur)
ce (cela)
ci (ceci)
ç (français)
ss (casser)
x in (soixante)
ti (nation, Boétie)
s (fils) exception

z=seize

s between two vowels (maison)
s linked

ʃ=shake

ch (charmant)

ʒ=pleasure

ge (Georges)
gi (gilet)
j (jamais)

j

y=(yeux payer)
i=bien, papier
ille=p paille fille
il=travail

x=ks (excepter)
x=gs (exemple)

ɲ=mignonette

gn (vigne)
gn (régner)

k=come

ca (camp)
co (corps)
cu (cube)
qu (quand)

g=gone

ga (gant)
go (gorge)
gu (guerre)
c in (second)

sounds. Under the sound *k*, for instance, *ca*, *co*, *cu*, and *qu* are given; under *s*, *ss*, *ce*, *ci*, and initial *s*, *tion*, *tie*, *x*, *c*. Now one or two lines of the dictation lesson are marked with the phonetic signs. Each day the pronunciation of these lines is carefully studied. Finally, to complete the students' impression of the exact value of the phonetic sound and the accompanying sign, they are required to prepare lists of words which contain a certain

selected sound, as, for example, **e**. Each day a new sound is thus treated until all the sounds have been thoroughly reviewed. This work, coupled with an average of three dictations a week and constant daily practice in reading, brings the pupil at the end of two months to a point where a very definite relation has been established between sound and spelling.

From this point it is but a step to teach the pupil to spell from sound. All the new words are first pronounced. Then their meanings are demonstrated according to the principles of the direct method, and finally they are spelled by the pupils. By constantly appealing to the ear we have developed the memory of the ear to such an extent that the sound is easily retained. Then the phonetic training has rendered the student capable of translating this sound into a written word. The result is an astonishing decrease in mistakes in spelling. This is a very valuable attainment, for it gives speed and accuracy in the acquisition of vocabulary. From this time on an effort is made to purify the pronunciation of the vowels, especially that of **e**, and to make the student accentuate the consonants.

The uvular *r* is taken up at the very beginning. This sound is approached from the *kr* and *tr* positions, especially the former. After four months a serious study of the sound ə or mute *e* is begun. Some of its characteristics were observed while studying verbs like *lever* and *appeler*. Its rôle in slow and rapid speech is studied, which leads to drill on the rhythm of the sentence and the verb, and a serious effort is made to eradicate the persistent American habit of letting the voice drop at the end, as this defect spoils the French flavor of even the most accurate pronunciation.

Finally, the various exceptions are treated, such as *fils*, *second*, *femme*, *faisons*, *mille*, etc., *le huit*, *le onze*, *eu*, *dites-le*, *mauvais*, *Paul*, *ennui*, *six*, *six francs*, etc. Furthermore, it has been observed that after such a careful and serious phonetic training the student will handle almost unconsciously and with almost no explanation such grammar principles as *cet été*, *un bel homme*, *son école*, *nouvel an*, *vieil homme*, as well as such orthographical peculiarities as *nous plaçons*, *je mangeais*, *je me lève*, *je m'appelle*, etc.

CONTENT AND METHOD IN INDUSTRIAL HISTORY

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The content of industrial history is universal. Even the most specialized of political, religious, and social historians take cognizance of economic influences. They are omnipresent, though possibly not omnipotent. To construct an economic or industrial history, then, is to follow the thread of economic interest throughout recorded history. But that is an impossible program for a high-school course limited to one year in time, and to adolescent comprehension in content. The capacity and advantage of the student are the great eliminators. Much history passeth his understanding. More of it serves no conceivable utility. Only as a minister to youthful growth and as a social science furnishing a new window upon life may industrial history justify itself through the creation, not of a jumbled memory, but of a point of view.

For industrial history is a point of view, a way of looking at the economic backgrounds upon which civilization has been reared. To a greater extent than political history, at least in high-school treatment, it deals with facts in large masses, constructing a philosophy rather than a narrative, and formulating for its younger votaries a creed rather than a record. Its service in the schools is to tune the growing spirit into harmony with his race, with Kipling to "Tell him I too have known," and out of the greeds and strifes of past achievement to find for him in man's long struggle the secret of a reasonable contentment and a rational unrest.

Few high-school courses claim scholarship as a goal. Their proper aim is citizenship, and in so pre-eminently civic a subject as industrial history, historical minuteness is of subordinate importance. The teacher may be an economic historian, but the pupil is only a citizen in process, and for him the subject possesses far greater utility as a social science than as a branch of history. Indeed, a great charm of the study is its relationship with almost

every department of social interest, its inseparable economics, and its delicate reaction to the counter-currents of politics and religion, philosophy and science. A consequent difficulty is to select the wisest field for emphasis.

From the varied riches of industrial history the pupil should actually comprehend the growth of technique in the economic processes of production and exchange, as well as in the social processes of distribution and consumption. That is, he must understand the evolution from the Stone Age to modern industrialism sufficiently to account for the relative density of population and our greater command over nature. Moreover, even a very meager acquaintance with the long warfare between capital in its various forms and labor in its various degrees of subjection will place him in a better perspective toward the battle raging round us. From this foundation in materialism he may come to recognize how dynamic are the world's activities in all things, and how its complexes through endless vicissitudes are seemingly leading toward democracy through a warfare in which he will himself soon participate.

The establishment of a point of view influences the arrangement of material, and from the vast mosaic of historical data three large patterns may be chosen. The time-honored method treats industrial history by countries in a synopsis of their characteristics, with some regard for internal chronology. Its advantage is a certain regularity, or more properly insularity, because the surgeon and his victim are quite detached from the wider currents of the world. Its disadvantage is that in local history one falls into traditional limits of time and place, and abandons the larger perspectives.

In contrast to this local method, industrial history might be regarded as a history of ship-building, lumbering, mining, agriculture, manufactures, etc., with only incidental regard to other economic and historic factors. But this is scarcely an independent method. It serves best as a supplement, or as a mine for topics, a reminder that present-day trades and industries have had a past.

A third possibility is a survey of industrial history by types, showing how similar are the articles of production and methods of

manufacture and distribution among widely separated peoples at any given stage of industrial progress, subject of course to the influence of geography and kindred factors, and not without relation to the religious, social, and political conditions of the various groups. Hunnish hunters are the economic kinsmen of aboriginal Americans. Abraham in his pastoral setting would feel at home with modern Arabians. Mesopotamian agriculture suggests a twentieth-century reopening of long-neglected irrigation ditches. The mediaeval potter would understand his Chinese brother of today. While in the industrial stage of production, the problems precipitated by the tyranny of *laissez faire* in England are even now being fought out in Georgia cotton mills. Such an opportunity for institutional criticism invites considerations upon slavery, serfdom, feudalism, towns and cities, the growth of world-powers, and the clash for empire. It takes account of militarism, finance and taxation, and the development of economic theory to explain the objective phenomena of various periods. So the mercantilists as philosophers of nationalism, the physiocrats as champions of land reform, the classical school as spokesmen for industry unfettered, and the various radical movements of nineteenth-century liberators, all find their logical place in a scheme of history which views industrial processes by types. The type method is undoubtedly best fitted to establish industrial history in its proper relation to history and the social sciences.

Accepting the type method as, on the whole, the most serviceable, one has by no means committed himself to a radical program. It is quite possible to accommodate a most orthodox attitude toward the content of industrial history to the ideal of finding parallels or sequences in modern experience, and at the same time to recognize that industrial history is only a fragment of the whole. Industrial conditions are a self-evident background for politics, sociology, religion, philosophy, indeed almost all human thought. Yet only at times do they frankly seize the foreground, and due allowance for the influence of mind over matter recognizes the existence of upper currents in human life only indirectly concerned with its material aspects.

From the viewpoint of democracy and modern industrialism, anthropology is more illuminating than ancient history. The

elementary processes were almost universally acquired long before recorded history, and they are, still, more vital to the economic life of man than are most of the details of ancient annals. Indeed, the contribution which ancient history does make to industrial is not the record of sporadic development of temporary institutions, but rather the relation of early arts, manufactures, and commerce to political and social organizations, to agrarian troubles, aristocracies and proletariats, to commerce, and the conflict for empire.

The industrial history of antiquity may well begin with the Babylonians, Assyrians, Phoenicians, Egyptians, and Israelites, but the time for them is short. Babylonian lessons are in irrigation, conquest, architecture, and rapid communication. Egypt furnishes citations for monoliths and irrigations, for perennial fertility, for caste systems foisted upon slavery, and for the temptation offered by wealth and luxury to strength and rapacity in a melting-pot of conquerors. Greece defies analysis, but the early "influence of sea power upon history," the factor of language as an integrator of nationality, the significance of commerce as the key to empire and the expander of Greek culture, as well as the decadent corrosion of luxury, all claim a natural emphasis.

Unlike the other states of the ancient world, Rome looms larger than ever in a century more and more animated by lust, for world-power, on the one hand, on the other, for a world-federation. The story of Rome's rise, glory, and fall offers a harmonious and unified picture of industrial causes and effects in their operation upon a highly organized society. The struggle for a Mediterranean lake, the rise of senatorial land-grabbers on the ruins of peasant proprietors crushed by slave competition, the land problem, with the projects of the Gracchi and the temporary solution of the civil wars, and, finally, the conquest of the East, with its sequence of stimulation, luxury, and decay, form an economic interpretation for the Republic.

For the Empire, methods of colonial administration, army enlistment, police control, taxation, and government support create a superstructure from which to view a population being taxed out of existence, a commerce unhealthy in its excess of imports over exports, and a people enervated and drained of vitality and patriotism. Here is a fertile field for modern comparison, since all societies

as living organisms represent in their metabolism the conflict of vitality and decay.

The barbarian invasions are a fruitful study for the American, who now confronts a similar migration, peaceful, as that was to a great extent, but so tremendous in its potentialities for good and for evil that the completed story of its fourth- and fifth-century forerunner is profoundly suggestive. Who made good additions? What did they contribute to the body politic? How did they learn to appreciate and to preserve the heritage of the past? These are realities at a time when the Anglo-American is passing on the torch to the Slav-American and other hyphenated newcomers.

The industrial life of the Middle Ages encourages those broad sweeps of history which always stimulate adolescent enthusiasm. The youthful mind more readily grasps a large idea than a small, and welcomes a glib philosophy of history more heartily than its minor details—hence youthful pleasure in a dualistic universe, in a conflict of virtue with vice, pessimism with optimism, light with darkness, progress with reaction, or in any of the obvious antitheses. Such is the appeal of the tidelike conflict of East and West, which, with its antagonisms of race, religion, and greed for empire, never escapes an economic foundation, whether one contemplates Phoenician trade or Crassus' expedition, Jeb el Tarik's march through Spain, or Francis I's and William II's love for Turks, though of course no better refutation exists of the completeness of such an interpretation than the crusades, in which so many motives crystallized into action, partly fanatical, largely adventurous, and in time even traditional. An equally telescopic conception sees in Charlemagne's eastern campaigns, and in German expansion beyond the Elbe the European counterpart of American conquest of the West.[1] Dangerous though parallels may be, the eastward spread of European culture foreshadows the westward spread of our own, and links satisfactorily with the enterprises of Czar Peter and the builders of modern Russia.

Mediaeval industrial history comprehends two broad considerations which deserve greater prominence than they usually receive: First, the evolutionary cycle of industrial unrest, the pro-

[1] James Westfall Thompson, "The German Church and the Conversion of the Baltic Slavs," *American Journal of Theology*, April and July, 1916.

tests of labor against extortion, and the methods by which these have been met or silenced. In this it is only just to recognize the intelligent efforts of the fathers toward solving the problems of poverty, sanitation, and the like. For example, the "Acts of the Privy Council" under Queen Elizabeth include many data on sane housing, street cleaning, and the avoidance of plague and pestilence; enactments made for the benefit of the rich, but most salutary for the poor. Secondly, taxation and finance are so engrafted in modern industrial organization that their history is essential, if only to rescue future publicists from error. Thus not long ago an influential supporter of the Lloyd-George budget, a chairman of the Land Reform Association, a member of Parliament well connected in British circles, in addressing our school declared that customs and excise dated from Charles I. In the case of customs, he was many centuries behind the times; for excise, he was a trifle too early. An intelligent study of industrial history ought to have included taxation, and to have guarded him from so egregious a blunder.

Indeed, taxation sheds a particularly illuminating ray over the industrial life of the taxpayers, and from the dawn of modern history, especially with the rise of powerful national states, it affords a constant approach to industrial history. It interprets mercantilism; it explains the colonial policy of eighteenth-century governments; it accounts for the prostration of the landed interest in pre-Revolutionary France, and the rise of the physiocrats; and, in the nineteenth century, it coincides with industrial life and policy among the western nations, altogether a field worth cultivating and not to be abandoned to the theoretical economists. But this is anticipating.

In their long period of tutelage, the barbarians erected a military caste upon the foundation of feudalism and serfdom. Hence the mediaeval manor presents some analogy with the ante-bellum plantation, while the mediaeval town, expanding through the purchase of privileges and exemptions by rich burghers from needy kings and barons, nourished that bourgeois class which dominates modern life.[1] The growth of industry and commerce,

[1] For a brilliant epitome of bourgeois origins, see Carl Lotus Becker, *Beginnings of the American People*, pp. 81, 82.

the development of banking, the refinement of technical processes, and the centralization of wealth contribute to mediaeval cities a very modern tone. Even the eternal problem of poverty echoes in the extremes of indigence and splendor, which cast so picturesque a glamor over the past, though educational foundations, hospitals, and cheap tenements, almost rent-free to the deserving, bear witness to constructive efforts not original with the twentieth century. The staples, then, of mediaeval industrial history are, necessarily, land tenure, including feudalism and serfdom; corporations, guilds and the rise of cities; banking, the evolution of capitalism, and the growth of commercial leagues, the last named being a new phase in the old question of sea power.

The influence of sea power upon economic history broadens in the mediaeval period. The Mediterranean never wholly lost its ancient importance. Justinian perceived in the sixth century that maritime supremacy was the clew to a restoration of the Empire. And in their turn, Venice and Genoa did not underestimate the seductions of Constantinople and the control of Asiatic communication. But with the development of Northern Europe, the Baltic, the North Sea, and the German rivers hotly contested the Mediterranean supremacy.

Among the countries to be studied, England's impress upon American institutions entitles her to first place. The economic struggle behind the British constitution, and the increasing class consciousness reflected in the Great Charter of John and its successive re-enactments provide valuable commentaries on the class alignment in contemporary America. The appearance of a third estate in the social revolution of John Ball or Watt Tyler in England, the Jacquerie in France, the Peasants' Revolt in Germany, and of a fourth estate in the invention of Gutenberg is as integral for industrial as for political history.

When to the class rivalries of mediaevalism are added the international rivalries of the early modern period and the cultural diffusions of the renaissance, the student has a foundation from which to view modern history with some intelligence. For simplicity, however, he had best confine himself to three or four considerations.

The sequence of colonial empires from Portugal through Spain, Holland, France, England, and, later, Italy and Germany is pre-eminently the domain of commercial and industrial history. This has been obvious to the textbook makers, but their treatment has been too literary. A series of maps from pre-Columbian times to the present day, indicating the growth and decline of commercial empires, particularly from treaty years or notable discoveries, would cover the work of many pages and visualize the race for power now culminating in the Great War. These maps would depict the extraordinary nineteenth-century revival of French and British empire, and would demonstrate Russian and American participation in the general movement toward world-powers. Nor are high-school pupils too young in this connection to balance the arguments of von Treitschke and his school on behalf of the uselessness of small nations—an issue of immediate interest.

A survey of manufacturing under the domestic and guild system heightens by contrast the undisputed climax of the course, the industrial revolution. But though their claims are weighty, is it not possible to moderate a little on the description of old machines? Insert pictures. They would save many pages, for historians are seldom mechanics, and their accounts of spinning jennies, and mules, and water frames are vague at best. They bewilder the future artisan, and daze the layman. In their place, how helpful it would be to know more about *laissez faire;* to understand Robert Owen's welfare work; to meet Lord Ashley, Richard Oastler, and the reformers; to trace the beginnings and rise of socialism; to estimate the economic bases of opposition, first to machines, then to reforms, and to appreciate European and American reaction to the free-trade propaganda.

Again mercantilism, as the dominant economic policy of the sixteenth- and seventeenth-century state, requires a further definition to establish its harmony with our newer nationalism, which utilizes the doctrine to justify the colonial and tariff policies accompanying the effort of manufacturing powers to control world-markets. The contrary doctrine of the physiocrats, suited to an agricultural state like eighteenth-century France, heightens the meaning of mercantilism, and leads to current views on single tax

and land tenure. Indeed, economic philosophy is essential for charting and interpreting the students' own world.

Having glimpsed thus hastily the economic forces and tendencies of the past, the first semester may terminate at any point subsequent to the industrial revolution. In any event, a whole semester is needed for the United States, and here the guide motif is revolution. America originally offered the grandest stage for a new liberty, and, peopled by victims of religious, political, and economic tyranny, she has clung to the ideal of a democracy, however imperfectly achieved. Three American centuries have now rung with protests chiefly economic. Economic motives fostered colonization; they precipitated the Revolution; they wrought for agglomeration and then for distintegration within the early republic; and, through the medium of slavery, they subverted the moral ideals of the people. Finally, the economic victory of New England in the Civil War molded our subsequent history upon a capitalistic basis,[1] bringing about in the march toward liberty that conflict with plutocracy which is the problem of present-day democracy, and which involves issues as vital for industrial welfare as ever confronted the fathers.

If the labor devoted to ancient and mediaeval industrial history is to bear fruit, life in America should unfold as an evolution from old-world antecedents. Thus the first settlements on the Atlantic seaboard and along the St. Lawrence constitute the American aspect of the expansion of Europe in the new nationalism then arising from the ashes of feudalism. Government encouragement of colonizing projects was a mercantilist expression of international rivalry. Paternal regulations of commerce and domestic life were further manifestations of the same policy, and suggest a comparison with French colonial methods in explanation of the outcome of French and British rivalry. In what economic respects was England the fit claimant for victory? And this achieved, what decision of the settlement of 1763 introduced the seeds of disunion?

The conquest of the Alleghanies and Kentucky represents the western phase of the Revolution, and the array of classes in the

[1] William E. Dodd, *Expansion and Conflict*, p. 328.

aftermath of the struggle reveals the pioneer West and South, that is the "up country" and the trans-Alleghany region, together with the remoter sections of New England, as allies in a common struggle against economic burdens. In this democratic movement, the conservative classes in the cities soon discovered that theirs was only a temporary interest. Hence the fervor of the Revolution subsided into the very cool calculations when the delegates to the Constitutional Convention were framing a fundamental law which safeguarded property so much more successfully than liberty.

Financial interests secured an adjustment in the East satisfactory to scrip-holders and debt speculators. In the West, the Whiskey Rebellion demonstrated that political loyalty was difficult to foster among economic malcontents imbued with a conviction that eastern traders and financiers were the sole beneficiaries of Federalist policy. Hostility to the refunding operations, the bank, and Jay's treaty, in part explains the Virginia and Kentucky Resolutions and western dreams of secession, which Burr's conspiracy came just too late to crystallize.

Fifty years of ante-bellum politics fathered tariffs and other federal measures rather as resultants of class and sectional interests than as a program for national welfare. The Hartford Convention and Nullification, and the agitations of 1820 and 1850, all denoted a local patriotism founded on sectional interests, which embraced local heroes like Clay, Webster, Calhoun, and even Cass and Benton of the older generation, and Sumner, Davis, and Douglas of the newer, in an affection seldom accorded to the presidents of the United States. These leaders were registering the will of a growing nation, divided between free labor and slave, manufacturer and staple farmer, producer and consumer, whose very existence was staked on a slavery issue so soon to fulfil Jefferson's prediction: "Nothing is more certainly written in the book of fate, than that these people are to be free."[1]

A new era of industrial progress attended the political unification wrought by the Civil War, and the organization of large-scale production renders this last stage the most complex of all, bristling with problems unsolved. From a contemplation of inventions,

[1] *The Works of Thomas Jefferson* (Federal edition), I, 77.

railroad construction, wealth increase and distribution, of tariffs, panics, and scandals; from a more or less sympathetic comprehension of populism, the Granger movement, and trust and labor organization which enlivened the century just closed, the future citizen is inducted into the topics of the present hour, face to face with the inscrutable "What next?" Rash the prophet; but youth dares all. Nor should sordid materialism strangle faith. Let the student realize how plastic, after all, is this conservative old world, how susceptible it is to the dynamic influence of a great cause or a great personality, and from the intelligent vantage-point of a knowledge of the past and an observation of the present, let him create a vision of the future, toward the shaping of which his own talents, be they small or great, may have some part.

Content in industrial history is so extremely rich that method merely seeks to extract the maximum of profit. For the first semester, a textbook is indispensable. The market is supplied, though the choice is not wide. But collateral reading and supplementary exercises fall within that domain of pedagogical prerogative where each is his own guide. Notebooks, maps, and research topics are time-worn devices. Lists of subjects merely inspire resentment. Even the items to be stressed are determined by class needs, and the teacher's equipment. In any event, the textbook provides a compass, and the huge scope of the work precludes elaborate experimentation.

The second semester marks, at Hyde Park, a more strenuous, but more interesting point in the teacher's province. Abandoning the text used in History B, he strikes out boldly in History A to construct textbooks by the notebook method. Coman's industrial history furnishes the teacher most of his material, which he prepares for the children's consumption on the lecture-method in a predigested process. The problem how to keep the class busy is solved, first, by insistence on careful note-taking in class, with frequent inspection of the books; secondly, by topics for research, with formal papers every four or five weeks at least; thirdly, by a scheme for reminding the young people of their impending responsibility. This involves a system of 3×5 cards, following the graduate-student research-method, after a solemn lecture on the cautions and advantages of the system. These cards outline pre-

liminary oral reports; they are inspected, and then returned for use in the formal papers.

At Hyde Park, excellent library facilities in the neighborhood increase the opportunities for research, but any school could apply the card idea, if its only equipment were an encyclopedia. For example, one of my boys has been investigating mineral resources in the Thirteen Colonies. His chief source of material has been the section on mining in the articles on each of the states in the Britannica. He is happy; he is doing actual research in a small way; and he is gathering information useful to the class. Students who have already encountered this system in high school have taken a valuable step toward bridging the mysterious chasm between high school and college. Modest assignments are best, but in sufficient variety to insure original work, and to constitute a review.

Among collateral topics, local interests deserve prominence. They provide admirable "primary sources," and awaken an interest in wider fields. Whatever the topic, sources of information cannot be overemphasized, and the use of footnotes is imperative. Each report should be a monograph in form, with no mercy shown to adolescent reluctance to render unto Caesar the things that are Caesar's. Quotation marks and footnotes record acts of virtue, and are a heroic recognition of the difference between mine and thine.

A useful work tonic is an exchange of clippings, through a clearing-house in which class members interchange newspaper and magazine findings on special fields of investigation.[1] Each thereby secures the help of all, and the class outlook is enlarged. Moreover, the special booklets embodying the final report make permanent records, frequently of high value.

Nothing need be said of bibliography. Local resources and limitations determine working conditions, and more detailed lists are available in the textbooks. Moreover, industrial history, in both content and method, rests not upon a historical apparatus, but upon a predetermined goal, and a spirit of co-operation in reaching it. These attained, formal content and pet devices are but minor considerations. History scorns a strait-jacket, and truth enters through many doors.

[1] A device suggested to the writer, and very successfully used by Miss Caroline M. Watson of Hyde Park.

SOCIALIZATION OF THE HIGH SCHOOL

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By this subject I mean making the high school meet the needs of society and of the community, making the subjects of a high-school course such as will open a direct approach to life. I do not mean by the term that the high schools should be cocoons and bee cells, from which will emerge the butterflies and drones of society. Schools have arisen because of the needs of society. This is true, not only of public schools, but also of our commercial colleges, so called, special schools, and technical and classical colleges. The Latin grammar school, which prepared for college in an age when Latin was the language in which many nations recorded their legal, scientific, theological, and literary contributions, passed out of existence because laws and treatises are no longer written in Latin; the academy, which was a finishing school for boys and which offered a wider range of subjects than the Latin grammar school, either merged into free public high schools or became distinguished as schools preparatory for colleges.

In 1870 there were only 160 free high schools in this country; ten years ago there were 8,000; today there are more than 14,000. Does not this indicate clearly that the public high school is an institution arising out of the increasing needs of society? "The high school is supported by the taxes of the whole people; it educates the children of the whole people; it must therefore provide for an adequate and proper education of the children of the whole people, of those who enter the industrial pursuits as well as of those who enter the so-called learned professions."

To arouse and develop the worthy potentialities of each pupil until they became actualities is one of the problems of the high school that has only recently received its share of attention from educators. The elementary school has been more or less successful in making the three R's more practical and in adding some sub-

jects that will connect with the home or with industrial pursuits such as domestic science, art, manual training, etc. Colleges and technical schools have specialized to meet the needs of men and women. After the readjustment below and above the high school, the secondary-school problems have come upon us like an avalanche. Industrial and financial conditions have changed greatly; professional requirements have increased many fold; society interests and relations are becoming more and more complex and exacting; the government, which formerly protected the individual in the exercise of his legal rights, has changed its function to protecting him in the exercise of his human rights. With these rapidly changing conditions on every side, can we satisfy our consciences by offering courses of study suitable to mediaeval times?

When you consider that the adolescent period is the time when the men-to-be are trying out their different powers, forming their habits of thinking and doing, and assuming their attitudes toward social, political, ethical, and religious questions, you will agree with Wellington and Gladstone that the high school is the strategic stronghold in the endeavor to make efficient men and women.

We have seen that the object of the Latin school was to prepare for college, and that the academy offered a liberal course for those who could not go to college. The high school must not neglect the 5 per cent who are preparing for college, as these furnish a high percentage of the leaders of the "masses" in public and private life. On the other hand, we must not forget that the educational standard of the community or state in a democracy is based upon mass education, and not upon class education as is found in a monarchy. The stability of a republic rests on the level of the morality and intelligence of all the people.

The colleges should soon recognize that they have a duty to society as well as to the individual. They should appreciate that the requirements for admission to college are no higher than those for citizenship in the best sense; that is, when it is possible for a boy to choose from the high-school course those subjects which will enable him to do a man's work in the shop or store, and thereby be incapacitated for admission to college, there is something radically wrong with the college-entrance requirements. The col-

lege owes recognition and inspiration to the high schools that seek to serve community needs.

Davis says, "If mental discipline be the desideratum for admission to college, may not subject-matter that has a rich content for practical life also be made to furnish as desirable and as satisfactory mental discipline as do the traditional subjects, the social utilities of which have been largely lost."

The members of the committee on reorganization of the secondary schools decided to plan the work for the child of twelve to eighteen years of age, thereby committing themselves to some form of the six-six plan. The child of twelve becomes a different being. He becomes skeptical about his faith, does not take his teachers and his parents into his confidence, wants to know the why and wherefore of the facts. To continue to cram down his throat the *ipse dixit* of his teacher without being convinced of its truthfulness would be to disregard the psychology of this period, would be as though you should try to keep the butterfly in the cocoon or the eagle in the nest.

The course of study has always been the battleground, and will be in every progressive school. What subjects shall be required, what kind of electives and how many shall be offered, and how they shall be elected, are some of the many questions that are ever present. That the course of study must be changed to meet changing conditions is evident to everyone who in this day of electric light has discarded the tallow candle. What a high school should offer depends on so many factors, that its place in the great system of education is constantly in process of evolution. Hence, no program of studies in time, in character, can be fixed with any degree of permanency. Certain subjects include, according to Bagley, "the priceless elements of the heritage of race experience"; these should be found in every course of study, because they afford a community of ideas that are necessary in a democracy. In fact, an important function of education in a democracy is to furnish a basis for common discussion of common problems. This does not mean that because a subject had some utilitarian value in bygone ages it should remain, as do some atrophied muscles and organs in our bodies; indeed, an operation, painful to some teachers, may be necessary to rid the course of study of an obstruction to progress.

The course of study should assist a great majority of pupils in self-discovery. This is the great advantage of the cosmopolitan high school. Frequently, some pupil's course is changed during the semester, and at the end many changes are made. Some time ago the teacher of mechanical drawing and shopwork told me that one of the boys would waste his time if he continued to prepare for engineering. The boy is now taking another course and is doing good work. Two girls who failed to get shorthand after trying it twice were transferred to another course. All the senses, seeing, hearing, smelling, tasting, and feeling, must be developed to the capacity of each. Memory training only does not develop the whole child. As Dr. Eliot has recently pointed out, "Mental action and reaction is strongest when eyes, ears, and hands, and the whole nervous system, the memory, and the discriminating judgment are at work together. The changes which ought to be made immediately in the programs of American secondary schools, in order to correct the glaring deficiencies of the present programs, are chiefly: the introduction of more hand, ear, and eye work—such as drawing, carpentry, turning, music, sewing, and cooking—and the giving of much more time to the sciences of observation—chemistry, physics, biology, and geography, not political, but geological and ethnographical geography."

By surrounding the adolescent with these as rising bells we may avert the "dreadful tragedy in the loss of real personalities who have all the native endowments of genius and leadership, but who for lack of proper environmental stimuli have remained undeveloped and unknown. We form the habit of thinking of great men as having appeared only at long intervals, and yet we know that great crises always discover great men. What does this mean but that the men are ready formed and that it requires only this extra stimulus to call them forth. Whatever the stimulus required, whether pride or shame, fear or favor, ambition or loyalty, responsibility or necessity, education should utilize each and all of these to teach men self-knowledge and self-control."[1]

The curricula should be planned for the whole boy and girl and should be taught by all-round, vitalized, and vitalizing teachers. The subjects offered to each pupil should "provide two sorts of

[1] Conklin, *Heredity and Environment.*

education—one to fit him to work and the other to fit him to live." When the pupil has completed his course, his certificate should give prominence to the physical attainments as well as to the intellectual.

Hence the course must be well balanced. "The body is not one member, but many. The eye cannot say unto the hand, I have no need of thee; nor again the head to the feet, I have no need of you. Nay, much more those members of the body which seem to be more feeble, are necessary." Doesn't this sound as though Paul would approve liberal and vocational education if he were writing to the Corinthians today? In the past the pupil who had brains, interest, and ambition had no trouble in finding suitable courses in the high-school course. And, as has been stated, this group must not be ignored. Similarly, instruction must be provided for the adolescent whether he be normal, subnormal, or retarded, in order to keep him in school as long as possible. Teachers realize that they cannot maintain the high standards of scholarship that they formerly obtained. As someone has said, "We have pointed to the number of *fine* graduates; we *will* point to the fine *number* of graduates." However, great care must be exercised that the pupils who get diplomas from any high school have finished in a creditable manner the prescribed studies; that they can do something well; that they are not deceived by thinking that they have a good preparation for the office, shop, or higher school, when in reality they have only a smattering; that they have attained a high degree of accuracy, of skill, of continued application to hard tasks, of honesty in use of time outside of the office or shop as well as inside.

The curricula for the early years of the high school, which according to the six-six plan are the seventh and eighth grades, should contain not only the worthy traditional subjects, but should also offer subjects that appeal to the motor and constructive interest and powers of the pupils, and that may be more or less vocational in character. The courses should be flexible enough to meet the reasonable choice of the pupils, and yet this flexibility should not lead to "elective chaos," since immature pupils may confuse liberty and license. One valid objection to elective studies is that pupils in our high schools specialize too early, or scatter their efforts by picking out the easy subjects or lenient teachers. Most pupils are not qualified to select the best curriculum.

Not what is easy, but what is vital, determines which subjects should be included in the course of study. To include only what pleases or interests the pupil may be to omit the essential things in preparing for life. To let him or her enter school or class late with tasks undone does not train for the exacting demands in the community where competition is keen. Pupils must be made to realize that they will get *out of the school* a preparation in proportion to the thought and time they put *into the school*. Time and concentration are just as necessary to make a clearly defined and lasting impression on the mind as on the sensitive plate. If pupils are permitted to take only those subjects that they like, they may get training and skill along a narrow line, but they may sacrifice that broad training which alone gives power of adaptability. The wise school administrator recognizes the great changes that are taking place in the industrial and business world, and stresses the education that has developed many of the higher nerve centers and organized many groups of ideas which will enable the man to adapt himself to changing conditions. One great objection to overspecialization before seventeen years of age is that only a few of the nerve centers are called into action; the pupil is trained or skilled for so few operations, that when changes come in the factory or business, he loses his position because he has no power of adapting himself. Dean Leete of Carnegie Institute of Technology says, "You can't build an intensive knowledge of one thing upon extensive ignorance of all things."

All of the changes are not to be made in the subject-matter of the course of study. The greatest change will be in the spirit of the course of instruction. While the so-called practical subjects have come to stay, they must be raised to the high standard of the academic subjects in efficiency, and the academic subjects must be made more practical. The teacher of science will cease to use the mediaeval pieces of apparatus and use present-day appliances of the farm, the factory, and the kitchen. He will draw upon the industries of his community for illustrations; e.g., the rural teacher will show that capillarity is illustrated by the preparation and cultivation of the soil. He can show how to detect formaldehyde in milk, organic matter in water, poisonous preservatives in meat and vegetables. He will impress his pupils with the fact that good

crops are largely chemical and physical reactions. Our teacher of trigonometry takes his pupils to the shop, and they work out a formula for cutting the gear of a cog-wheel. A textbook in geometry asks the pupils to find out how far back a football should be carried, after a touchdown has been made 25 feet from the nearest goal post, so that the goal can be more certainly kicked. Similar methods will give new life to a subject that has been merely a form of mental gymnastics for many. If more of the topics selected for compositions, especially for oral work, would deal with the vocations of the community and with the prospective vocations of the pupils, the part of English most disliked by many boys would become the most interesting and useful. Children learn by doing, and this is a great argument in favor of dramatization of literature. When the recitation in civics is freed from the dry routine of textbook work and becomes the clearing-house of the practical work done by members of the class in the community, then the boys and girls will be made to feel with Dr. Dewey that "school is not a preparation for life; it is life." Other subjects lend themselves to socialization as readily as these.

The cosmopolitan high school may be the great melting-pot of our cities. To segregate those who are going to college from those who are preparing for industrial or commercial life may engender snobbishness and lead to social division on a false basis of education or vocation. We don't want to transplant the stratified society of Europe into democratic United States. Pupils of high-school age should develop sympathy and respect for phases and conditions of life other than their own. This is more easily accomplished where all classes meet on a common basis in the recitation rooms and on the playground. The tolerance of the viewpoints of the college-preparatory and industrial pupils on the part of the commercial pupil better prepares him to enter the business world, where he must respect the views of his various patrons. The cosmopolitan high school has greater possibilities of generating power that will make for higher manhood than has the special school.

All of the so-called outside activities of the high school, when properly guided and guarded, are tributaries to the great, broad current of culture and knowledge. These activities should be made

the basis of organizations where the relations of the individual to society and of society to the individual may be learned at first hand. These organizations should be self-directed as far as the pupil is concerned, but at the same time guided by the wise teacher, both to control any individual who may be a menace to the organization and to give such aid as may be given by a master-hand.

The social needs of the high-school pupil are so important that they ought to be included, not only in the subject-matter of the studies and in the selection of teachers for the course, but also in the plans of the schoolhouse. While the social life of the school may not be concerned primarily with evening parties in the school building or elsewhere, yet it will not be ignored by those teachers and principals who appreciate the tremendous dynamic force of the social impulses of the high-school boy and girl. Neglected, the social life may ruin body and soul; controlled and guided, its possibilities for the good of the individual and the community are immeasurable. This means that the social life is only a part of the school, and that it must never detract from the serious business of study.

The hours outside of school, the leisure of men and women, demand more than passing notice. To assume a negative attitude on the question of one's avocation is often to destroy one's efficiency in his vocation. To shorten the hours of labor without enriching the life of the laborer is to give him more hours in which to lower his vitality and morals. The hours of leisure make more criminals and loafers than do the hours of labor. Shall the hours of leisure promote enlightenment, culture, and progress, or promote degeneracy, depravity, and decay? The one encourages the beautiful in music, art, and literature; the other seeks satisfaction in prize fights and the common vices. The cultural subjects become extremely utilitarian for the leisure hours. The great need in our changing social life is an equipment for the right use of leisure.

Social activities are recognized factors in character development. Character is to the individual what muscle is to the athlete. Neither is made by lectures or sermonettes. They are made by action, by struggle. As teachers and administrators, we must

plan activities that will develop and strengthen the character as well as the body.

Should the high school be socialized? Yes; schools that trained only for individual ends have long since failed, and have been succeeded by schools that educate the individual for social service; conditions and customs have changed, and the schools must change their methods and equipment so that their pupils will be able to do their work; the adolescent must be taken as he is and not as we wish him to be. To meet the new obligations, some reorganization may be necessary. Many of our courses of study and textbooks must be re-written, in order that the needs and capacities of the largest number of pupils may be met. Co-operative courses will assist many boys and girls to find themselves. Colleges must recognize that the highest mission of our high school is to raise the level of thinking of all of the people, to give concrete information and impulse for social living, and to develop moral intelligence, judgment, and purpose, so that our pupils may be as well prepared for the community as for college. All of the activities and associations ought to be used to give pupils experience with real motives and actions. The school must widen its field and must provide for the entire child by requiring, if necessary, that all pupils take some industrial work throughout the course; each building must be provided with a library, clubrooms, dancing-rooms, a gymnasium, a dining-room, an assembly room, etc., and should be open throughout the afternoon and evening to serve as a clubhouse and recreation center (under proper arrangements and supervision) for the student body and their friends. The wider use of the school-plant for evening classes has made many enthusiastic friends for the high school who are made to realize that the high school as an institution is trying to meet the needs of the entire community. Teachers' training schools and colleges must give more practical work in these broader fields; and the teachers in our high schools must realize that the social and moral welfare of each pupil largely depends upon their attitude and activity, that they must look beyond the daily or yearly work and get a new vision of the responsibility of high-school teachers in training their pupils to be useful members of society, with all that that implies.

EDUCATIONAL NEWS AND EDITORIAL COMMENT

Teachers' Institutes

The *Ohio Teacher* asserts that much valuable time is wasted in teachers' institutes by instructors who attempt to make their addresses popular by means of stories and anecdotes. This editor affirms that teachers prefer to listen to something "that will help them teach." The phrase "listen to something that will help them teach" raises a far more serious criticism against many institutes. County or city superintendents ought to realize that an institute in which the instructors merely talk, and the teachers merely listen, is not likely to result in better teaching. For illustration, a typical institute is organized as follows: At 9:00 the teachers gather in an auditorium. The first exercise is conducted by an instructor in music. The drill is necessarily exceedingly superficial, the net result being that a few of the women teachers learn some new songs. Then follow addresses by two men also called instructors. One of them gives one of a series of five talks on the teaching of a special subject; the other gives a series of so-called inspirational lectures. In the afternoon the program is duplicated. The teachers listen quite respectfully; but the addresses are, and necessarily must be, more or less general. Such general lectures, even if they are conscientiously presented by able men, and listened to eagerly by conscientious teachers, are not likely to have immediate effect on instruction throughout the county.

Why not employ instructors, not to talk to a large group of teachers having a great variety of interests, but to instruct small groups, who need guidance in the field of the instructor's speciality. Say that a man from the university is employed. Let him meet a small group of thirty to fifty teachers twice a day throughout the institute week in intimate consultation about his specific field. Let him conduct his work in the form of a round-table discussion. Let him create the attitude of intense study of the problems of teaching in that field. In short, do not compel him to talk; require him to teach. Give him the opportunity of being in fact, as well as in name, an instructor.

Teaching Pupils to Study

The attention which is being given to training pupils in effective methods of study is one of the most striking facts in the present school procedure. Supervised study in some form or other is being tried in most progressive schools. The hour period, the double period, the large-group laboratory method, the special study period, represent some of the administrative devices under which the experiment is being tried. It is to be hoped that careful studies will be made and published of methods and results, so that we may have some basis for determining which is the best of the widely varying methods employed. In any method the important element is the teacher. Until recently there has been very little available material to guide teachers in developing effective study-habits in their pupils. Dewey's *How We Think* (Heath) has given us the fundamental principles, but most teachers need more detailed and concrete directions than they are likely to derive from a study of this excellent book. Sandwick's *How to Study* (Heath) contains much interesting and valuable material for both the teacher and the pupil. The best brief and practical treatment of the subject is Whipple's *How to Study Effectively*, recently published by the Public School Publishing Company.

The "Study Helps" which have been used for several years in the University of Chicago High School, the use of which was described in the *School Review* (XXIII, 548) have proved effective and have been adopted in a large number of schools. These have recently been made available through the University of Chicago Press. A very similar set of suggestions on *How to Study* has been published by the Indexers, Chicago. The result of this widespread attention to the laws of habit formation and the effort to base methods of instruction on these should result in a greatly improved technique among teachers and a corresponding increase in the efficiency of our schools. F. W. J.

Qualifications of High-School Teachers in California

Since 1914 teachers in the high schools of California have been required to present one year of graduate study. In the past this graduate study was in the subject-matter of the courses the student was preparing to teach. Recent revision of the law for this graduate year emphasizes the importance of preparation for the actual processes of teaching. The issue is squarely raised as to whether all of the graduate work of a prospective teacher should be entirely in subject-matter, or whether a considerable share of it ought to be in methods of teaching.

The requirements established by the State Board of Education are as follows:

1. Each candidate shall have received a Bachelor's degree from a standard college, requiring not less than eight years of high-school and college training.

2. Each candidate shall submit evidence that in addition to the academic and professional courses required for the Bachelor's degree he has completed at least one year of graduate study, doing full regular work, though not necessarily a candidate for a degree, in an approved graduate school. Such graduate study shall include at least one full-year course of advanced or graduate work in at least one of the subjects in which the candidate expects to be recommended for certification.

3. Requirements of fifteen units of work in education.

Each candidate shall also submit evidence that he has completed in undergraduate or graduate standing, or the two combined, not less than fifteen units (semester hours) of work, in courses listed in the department of education in the institution in which the graduate work is completed, or courses in other departments of that or other institutions accepted as preparation for teaching by the department of education.

The required fifteen units of work in the department of education include the following courses:

a) A course in school and classroom management, or equivalent work—a minimum of one unit.

b) Work in actual practice of teaching, with conference—a minimum of four units.

c) A teacher's course in at least one subject in which the candidate expects to be recommended for certification, if such course be given in the institution and be accepted by, or listed under, the work in education —a maximum of three units for all such courses.

d) A course in secondary education, presenting particularly the purpose and attainable goals of high-school work—a minimum of two units.

e) Such other courses relating to the theory, function, and administration of public education as are needed to complete the required fifteen units.

The law also provides that the State Board of Education may consider the cases of individual candidates who have twenty months of successful experience as teachers and who have not the exact credentials required for regular certification. The State Board of Education in considering such cases will have in mind as the standard the same requirements as for regular certification; that is, four years of high-school work, four years of college work, and a half-year of postgraduate uni-

versity work. As equivalent the Board may consider any evidence of scholarship, education, training, travel, or other means of advanced culture that may be offered. To candidates who in the judgment of the Board fully meet the academic and professional standards of regular certification will be granted the State Board high-school credential, upon which county and city boards of education may grant regular high-school certificates.

It will be noted that the "year of graduate study . . . . shall include at least one full-year course in at least one of the subjects" the candidate prepares to teach. This is equivalent to six semester hours. In addition are required not less than fifteen semester hours in education. Now, the average graduate student can carry successfully about 24–30 semester hours; therefore the California requirements allow him 3–9 semester hours for electives.

A principal or superintendent may wisely spend two-thirds of his graduate time in professional courses; but the proportion for teachers of special subjects should be somewhat smaller. Probably the California State Board reasoned that the student would choose courses in his special subject to the full extent of permitted election. If the California student utilizes half of his time, 15 semester units, for required professional courses, he has left the 6 semester hours prescribed, and 9 elective semester hours for subject-matter courses. If we consider that in all likelihood the major part of his last two undergraduate years were highly specialized in the subject he prepares to teach, it will not seem unreasonable to divide his graduate year equally between the two branches. One unfavorable criticism of the California program is the relatively small amount of credit allowed for teachers' courses in special subjects the students are preparing to teach.

An Innovation in Part Time

Dean Schneider inaugurated some years ago the part-time plan for students in engineering courses. Modifications of his scheme have appealed to manufacturers and to teachers alike in various parts of the country; especially in Massachusetts has this idea been carried far. It remained for Dean Ayer of the Municipal University of Akron, Ohio, to carry the part-time plan into training for business, by obtaining the co-operation of merchants. Akron, with its great rubber industries, is especially well adapted to try the experiment. Dean Ayer announces:

> The Department of Business Training of the Municipal University of Akron was established by vote of the directors on May 15, 1916. Students are able to gain practical experience while pursuing a course in the underlying

theory. The students are grouped in two sections, one of which is at work and the other in attendance at the University. At the end of a designated period, those who were at the University go to the business organizations, and those who were employed in the business organizations go to the University.

Students are required to start work in July and work continuously until September, when alternation begins. The business organizations of Akron have been very cordial in the acceptance of the plan, and places of employment are assured for as many students as the facilities of the University can accommodate. Students are paid for actual time at work, the rate to be agreed upon by the University and the employers. Positions are secured by the dean of the College of Engineering.

The Department of Business Training and the employer plan the work so that the student gets a graded experience, beginning with work requiring no experience and ending with responsible duties. This work and the University training will be co-ordinated by the head of the department so that the experience gained and the courses will amplify each other.

Self-Expression

The following quotation from the *Journal of Education* (London, May, 1916) is interesting and will meet with approval:

English people, we are continually being told, lack the faculty of self-expression, and therefore children ought to be trained in self-expression. But here comes a problem. If writing is to be genuine self-expression, the child must write only when he really wants to express something; he must not write at the order of somebody else, for if he does he will write artificially, inventing, instead of expressing ideas and feelings. If he feels nothing about a primrose except that it is a yellow primrose, we must not expect him to say more. We should not encourage eloquent description and pretty sentiment which the child feels no real impulse to give us. We are inclined to judge from some school books which we have recently seen that there is a real danger of teachers fostering this kind of artificial composition. The value of it is certainly problematic. Perfect sincerity in speech and writing is more to be desired than facility of utterance. We shall not gain anything by training up a generation which can write graceful conventionalities about anything and everything. Rather we should teach boys and girls that the first rule of writing is: never write unless you really want to say something. Huxley we think it was who said that there was only one good rule for style: have something to say and then say it—an epigram which, if not adequate for the needs of the teacher, is a very solid foundation-stone.

Immediate Results of the Cleveland Survey

It is quite natural that a piece of searching investigation like the Cleveland Survey should arouse opposition on the part of people whose delinquency was exposed. The purpose of that survey was not primarily to discover what was good in the school system of Cleveland. Quite the contrary, the purpose was to determine what were the weaknesses of that system, in the light of most advanced educational practices, and

to recommend definite measures of reform. It was a diagnosis of educational conditions with the avowed purpose of prescribing remedies for a system suspected of curable disorders. In *School and Society*, October 7, 1916, Allen T. Burns, director of the Cleveland Foundation, recounts an amazing mass of maladies brought to light by the survey. Of course, the city school board and the superintendent under whose administration the educational rottenness had culminated could not be expected to be enthusiastic over the public disclosures of their shortcomings. Both board and superintendent writhed. The latter, asked to resign when the supervisory system was shown to be seriously at fault, refused to comply. On the basis of a contract which has one year to run, he retains his position. The request for the resignation of the superintendent indicates that the board, even if critical of the survey, is not petty, and is not blind to its duties. Moreover, the list of survey recommendations which the board has inaugurated is further proof of the efficacy of the investigation. Mr. Burns summarizes the innovations as follows:

> Here are some of the chronological sequels, if not results, of the survey. They represent in some cases only board action as yet, not actual execution:
>
> Put into operation the Cleveland-Gary double-platoon plan of class rotation, which relieves congestion, gives greater variety of play and study for pupils, and saves building cost. Use of the plan at Kennard School has saved $30,000 by economy of space.
>
> Raised salaries for lowest-paid teachers from $500 to $550.
>
> Adopted a new policy for wider use of school buildings; opened 13 community centers in schools.
>
> Tightened census and truancy systems; added 12,000 children of school age to the roll in one year, gaining $24,000 in fees from the state.
>
> Enforced law requiring health certificates to protect all children leaving school to go to work.
>
> Reorganized teaching of English to immigrants to give them greater encouragement and opportunity.
>
> Introduced new courses in arithmetic, geography, and elementary science; increased supplementary reading; adopted a new spelling-list.
>
> Started special instruction to cure speech defects; bettered health work generally; improved school toilets; lowered blackboards for small pupils.
>
> Opened school playgrounds after school hours.
>
> Established junior high schools to bridge the gap between grade and high schools.
>
> Lengthened academic high-school day to equalize salaries of all high-school teachers.
>
> Standardized high-school markings.
>
> Put supervisory as well as clerical duties upon school principals.
>
> Improved method of keeping school records; took over dental clinics as a school function.

Ordered reading of more literature with less detailed analysis in high schools.

Made libraries part of school plants.

SUMMARY OF MORAL EDUCATIONAL PROGRESS IN THE HIGH SCHOOL

Mr. Jesse B. Davis in *Religious Education* for October offers a very complete discussion of the progress made in introducing moral training into the high schools since 1911.

The committee appointed by the Religious Education Association in 1911 made three significant recommendations: first, "that teachers be impressed with their responsibility for a greater use of their personal influence with pupils through personal contact and sympathy than is now customary"; second, "that the teacher's opportunity for personal contact and influence with the children be enlarged"; and third, "that an increased effort be made to secure the moral values of the content of all subjects in the curriculum, so that moral instruction may be enlivened, appreciation awakened, and personalities enriched." In response to the first two suggestions superintendents have endeavored to exercise more care in the appointment of physical directors for boys and girls, deans for girls, and in many cases have established very helpful advisory systems.

The subject chosen in Grand Rapids for direct moral and vocational guidance is English. Under the writer's plan the instruction in English is to be shaped from the sixth grade to suit the moral and vocational needs of the individual pupils. The teaching of morals through English is neither new nor recent. There is no more prolific source of great spiritual truths than English literature. The great masterpieces are living monuments to truth, fidelity, patience, and their kindred virtues. The vocational-guidance course outlined by Mr. Davis includes the biographies of truly successful men and women, but pays but slight attention to their works. The new courses seem to require less cultural and more scientific material.

Aside from the changes being made in the curriculum, the writer gives in detail a more important phase of moral and vocational training—the efforts which are being made by the Y.M.C.A. and Y.W.C.A., by the parent-teachers' association, and by other organizations to use the school plant for social activities. Under this plan the school authorities are enabled to shape and direct the community. Where the plan has been tried, direct results have been reported in the moral uplift and in closer connection between the home and community with the school system.

BOOK REVIEWS

The Motivation of School Work. By H. B. Wilson and G. M. Wilson. Boston: Houghton Mifflin Co., 1916. Pp. ix+265. $1.25.

With the attempt to make education universal there has arisen a problem which was not acute so long as the children who were to be educated were allowed to select themselves by their aptitude for, and their interest in, the work which the school offered them. It is the problem not simply of leading them to the water, but of making them drink. The process of making children drink, commonly called motivation, resolves itself into finding out what the child likes to do, and hitching the things we think he ought to learn to do to these things. The problem of the book before us, then, is to show how the work of the various subjects taught in the school may be so related to those ends which the child naturally desires that he will do that work with enthusiasm.

The practical part of the book, which comprises about five-sixths of it, is devoted to full, detailed illustration of the actual procedure by which the various school tasks may be motivated. These illustrations are commonly the reports of devices which have been successfully put into practice. The "fundamental" subjects—language, composition, history, geography, and arithmetic—are treated in detail. Writing, spelling, music, drawing, home economics, manual training, agriculture, and nature-study are treated more briefly. These chapters abound in practicable and useful suggestions regarding methods by which school work may be made more significant to the child than it usually is, and hence may awaken him to greater activity. The practical recommendations are well balanced and sane.

The theoretical discussions in the first part of the book are not so clear or judicious as are the practical parts. The authors express extreme views, which would not meet with general agreement on the part of students of education, when they exalt the importance of motivation by denying the existence of fatigue in the school, or of general training. The discussion of plateaus in the learning-curve does not quite do justice to the experimental evidence, and it is not clear how the difference in the curves of forgetting of acts of skill and of associations relates to motivation. But the value of adjusting the work of the school to the child's natural impulses does not stand or fall with the conclusions on these points, and teachers and administrators will unquestionably find this book very useful for the wealth of suggestion for practical procedure which it contains.

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Representative English Plays from the Middle Ages to the End of the Nineteenth Century. Edited with introductions and notes by JOHN S. P. TATLOCK, Leland Stanford Junior University, and ROBERT G. MARTIN, Northwestern University. New York: Century Co., 1916. 8vo., pp. 838. $2.50.

"In the present collection, for the first time, representative English plays from the earliest period to our own generation are included in one volume." This editorial statement suggests at once possibilities of great usefulness in such a collection. The volume seems intended for fairly elementary students, since it includes the plays one invariably chooses first for studious reading and presents introductions designed for the beginner rather than for the advanced student. It should surely afford a pleasant introduction to the history of English drama.

Aside from the problems of choosing plays, the main labor of the editors would seem to have been the preparation of an introduction for each play. The bibliographies are brief—necessarily so, perhaps; and the texts are not new. Occasionally these introductions seem a bit too elementary: certainly college students of more than Freshman attainments could spare such a passage as that on Addison's personality or the somewhat moldy truth, delivered apropos of *The Lady of Lyons*, that "it is only the highest excellence that is timeless." They are also not remarkable for careful statement, though not marred by glaring blunders. To say that Pope Urban IV "instituted in 1264 the church festival of Corpus Christi," and omit to say that processional celebration of the day began at least a half-century later, is to affix a rather meaningless date to one's first sentence (p. 3). The beginner will certainly be unable to read properly the ambiguously punctuated list of Middleton's comedies. The introduction to *A Blot on the 'Scutcheon* (p. 782) remarks on "the song in Act II, one of the very finest of Browning's love-lyrics"; the lyric comes in Act I. The first column of p. 421 contains, near the top, a sad typographical mix-up, whch it should have been possible to avoid. Lastly, at times even the English is hurriedly and carelessly written. Least pleasing from this aspect is the introduction to *The Cenci*. The sentences here are at times contorted, at times telegraphically condensed, and at times loosely unified. The Freshman will take heart when he finds his instructors writing (of Shelley): "The latter part of his life especially he devoted to poetry, living in Italy from 1818 to 1822, when he was drowned" (p. 115). He will be perplexed by such contortions as the following sentence on Fletcher's style: "No blank-verse dialogue but Fletcher's resembles more the matchless prose of Congreve and Sheridan" (p. 341). On the other hand, it is only fair to say that the preface to *Philaster*, among others, is admirable in its graceful compactness. Usually we are told briefly and justly the historical significance and the literary qualities of the play under discussion.

After all, in such a textbook it is usually the choice of material, rather than comment on the material, that makes the book useful. The choice of plays here is excellent, except for the inclusion of *The Cenci* and *The Blot on the 'Scutcheon*. These betray the fact that the editors are students of English literature and of the drama as poetry. *The Cenci* has little right in such a volume and the inclusion of two "closet dramas" will certainly tend to impress students with an improper notion of the excellence of nineteenth-century drama. It would have been better, considering the history of the drama, to omit these two and to give us a play by Synge and possibly *George Barnwell*. But in general selection of plays, the comments, and (it deserves mention) the typography are so satisfactory that the book will be widely used. It should be of great assistance to persons giving courses on the drama "From the Beginnings to the Present Time"—we believe that is the course label!

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Christianopolis. An Ideal State of the Seventeenth Century. Translated from the Latin of JOHANN VALENTIN ANDREAE with a historical introduction, by FELIX E. HELD. (In "Germanic Literature and Culture, a Series of Monographs," edited by JULIUS GOEBEL.) New York: Oxford University Press, 1916.

Since it is undoubtedly true that Johann Valentine Andreae, the friend of Comenius, "represents a very important step in the development of the principles of education and scientific investigation," Dr. Held's work is most welcome. The introduction of over a hundred pages makes plain the value of the writings of that teacher and reformer, and proves that Christianopolis (*Reipublicae Christianopolitanae Descriptio*, 1619) deserves an important place among the early utopias. It is only possible in a brief notice to call attention to a part of Dr. Held's results. Against von Mohl, Sigwart, and others it is shown that Andreae gave a new conception of an ideal state, not slavishly depending upon More and Campanella, and that in matters of science and education Andreae shows independence and originality. The author brings out, further, valuable material on the connection between Andreae's works and Bacon's *New Atlantis*, and, last but by no means least, shows that Andreae's ideas of educational reform and his idea of a "college" had important influence upon the men who founded the Royal Society of London. Dr. Held's translation of *Christianopolis* is not only accurate, but it reads easily.

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BOOK-NOTES

(Detailed discussions of some of the following books will appear later.)

Accredited Secondary Schools in the United States. Bulletin, 1916, No. 20, Department of the Interior.

ALLINSON, F. B., and ALLINSON, A. C. E. (Editors). *The Aeneid of Virgil* (English translation by JOHN COMINGTON). Chicago: Scott, Foresman & Co., 1916. Pp. 452.

Annual Report of the School. Committee and the Superintendent of Schools, City of Cambridge, Mass., 1915.

CAJORI, FLORIAN, and ODELL, L. R. *Elementary Algebra.* New York: Macmillan, 1916. $0.75.

CARY, C. P., State Superintendent. *Suggestive Studies of School Conditions,* Madison, Wis.

COULE, B. *The Business of Being a Friend.* Boston: Houghton Mifflin Co. Pp. 122. $1.25.

The essays put some sound advice in an interesting way. It should appeal to girls of high-school age.

DEARBORN, GEORGE VAN NESS. *How to Learn Easily.* Boston: Little, Brown & Co., 1916. Pp. 227. $1.00.

FELMLEY, D. "Normal Schools Costs," *Minnesota State Normal Schools Quarterly Journal,* September, 1916.

FUEUTES, V., and FRANCOIS, V. E. *A Practical Spanish Grammar.* New York: Macmillan, 1916. Pp. 313. $1.00.

HAYES, G. H. *Problems and Exercises in Economics.* New York: Henry Holt & Co., 1916.

JONES, W. H. S. *Scientific Method in Schools.* Cambridge University Press. Pp. 36. $0.30.

KOREN, W., and CHAPMAN, P. A. *French Reader.* New York: Henry Holt & Co. Pp. 285.

The selections have literary quality, variety, and freshness. The unusual feature of the book is a brief statement of the rules governing the formation of irregular verbs and a synopsis of the principal regular and irregular verbs.

MAGNUS, L. A. *A Concise Grammar of the Russian Language.* New York: E. P. Dutton & Co. Pp. 270. $1.50.

Monthly Record of Current Educational Publications. Bulletin, 1916, No. 22, Department of the Interior.

Mooseheart Year Book, 1915-1916. Mooseheart Press.

PITT, ST. GEORGE LANE FOX. *The Purpose of Education.* Cambridge University Press, 1916. $0.75.

POTTS, RUFUS M., Insurance Superintendent. *Forty-eighth Annual Insurance Report of the State of Illinois.* Part 2, "Life Insurance." 1916.

Reorganizing a Country System of Rural Schools. Bulletin, 1916, No. 16 Department of the Interior.

SAMPSON, CHARLES H. *Algebra Review.* Yonkers-on-Hudson, N.Y.: World Book Co., 1916.

SCHLEUKER, B. A. *Bulletin for Teachers of German.* Bulletin of University of Minnesota. Pp. 41. $0.25.

SHAWMAKER, H. *Tales from a Boy's Fancy.* Kansas City, Mo.: Burton Publishing Co. Pp. 320. $1.50.

The stories are totally unsuited for high-school pupils, both in subject-matter and in style.

SMITH, H. B. *Establishing Industrial Schools.* Boston: Houghton Mifflin Co. Pp. 162.

A handbook of information to beginners in the work.

SNOW, W. L. *The High School Speaker.* Boston: Houghton Mifflin Co., 1916. Pp. 237. $0.90.

The book has a good range of readings with selections suitable for both boys and girls.

SPRINGER, ISADORE (Editor). *Teacher's Year Book of Educational Investigation.* Department of Education, City of New York, Division of Reference and Research. Pp. 53.

STARCH, DANIEL. *Educational Measurements.* New York: Macmillan Co., 1916. Pp. 197. $1.25.

STONE, A. P., and GARRISON, S. F. *Essentials of Argument.* New York: Henry Holt & Co., 1916. Pp. 322.

The new feature of the book is a very sane and helpful chapter on delivery.

STRATTON, W. T., and REMICK, B. L. *Agricultural Arithmetic.* New York: Macmillan, Pp. 239. $0.50.

Vocational and practical.

THALIAN, J. L., and WECKEL, A. L. *Laboratory Manual of a Year in Science.* New York: Row, Peterson & Co. Pp. 138.

The book might prove very useful in a school not equipped with laboratory facilities.

The Department of Hygiene and Physical Education in the University of Cincinnati. Pp. 47.

VOORHEES, H. C. (Editor). *The Law of the Public School System of the United States.* Boston: Little, Brown & Co.